

# THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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Reading Matter Contents.....	page 44
Alphabetical Index to Advertisers ..	133
Classified List of Advertisers.....	135
Advertising and Subscription Rates ..	53



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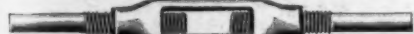
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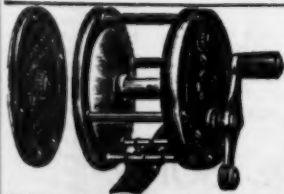
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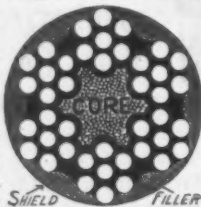
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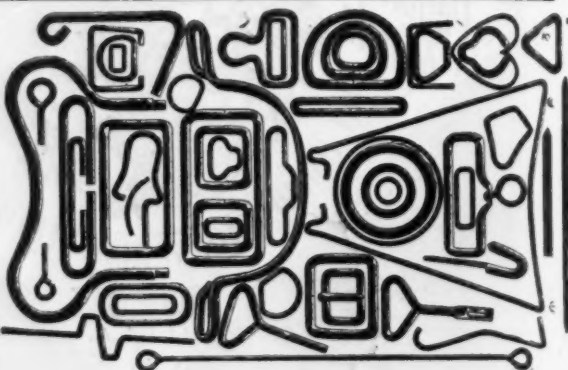
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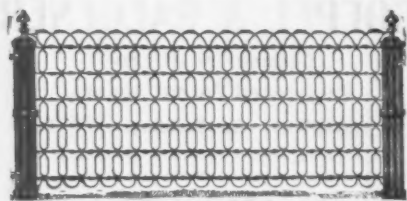
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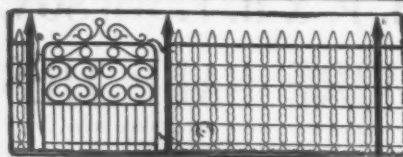
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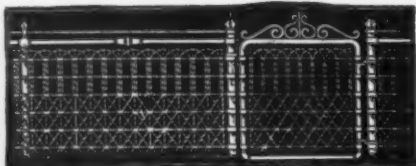
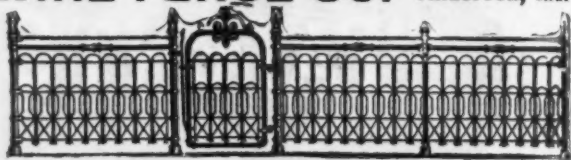
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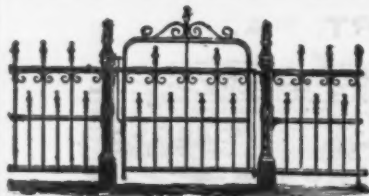
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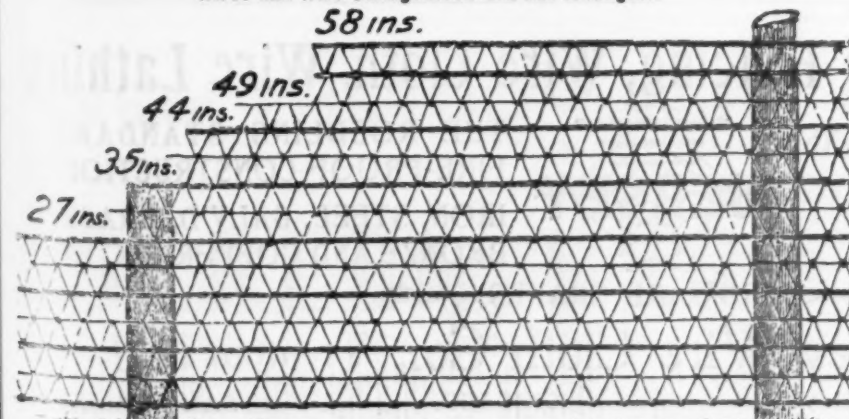
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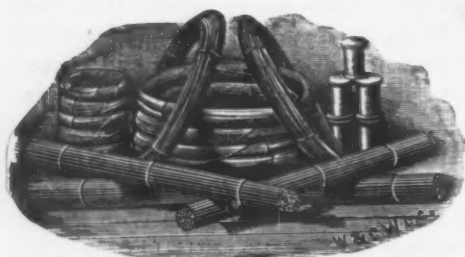
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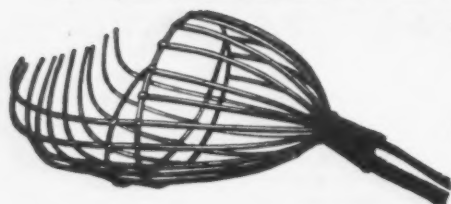
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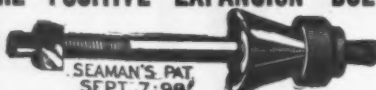
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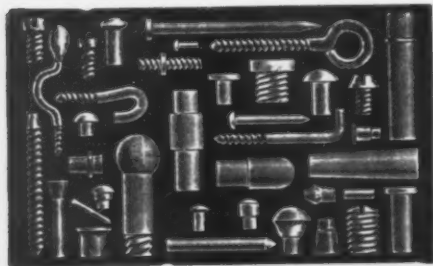
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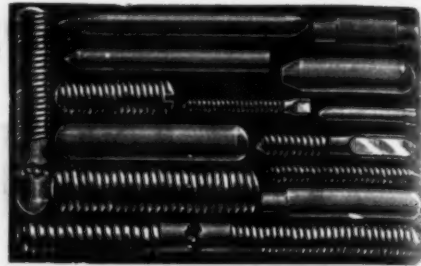
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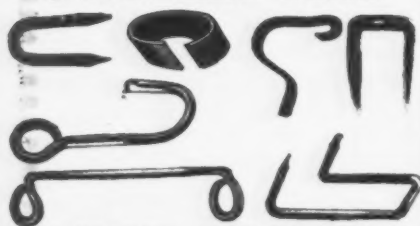
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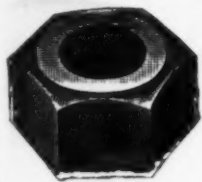
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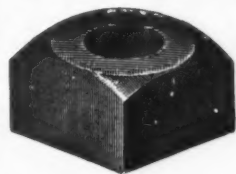
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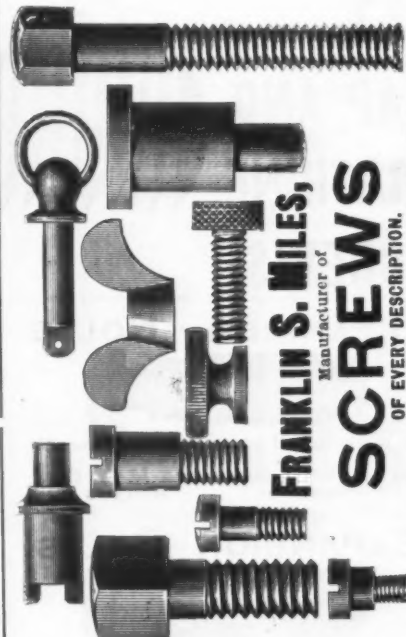
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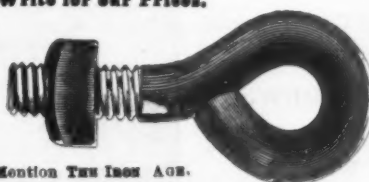
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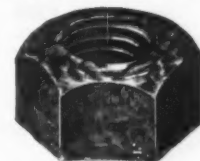
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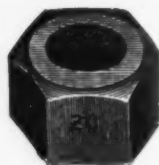
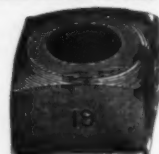
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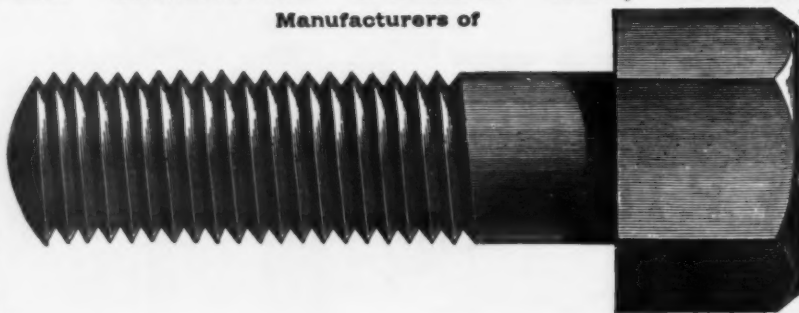
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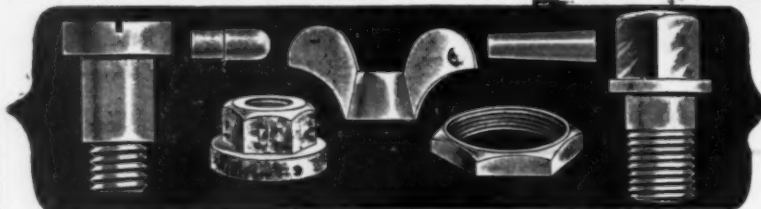
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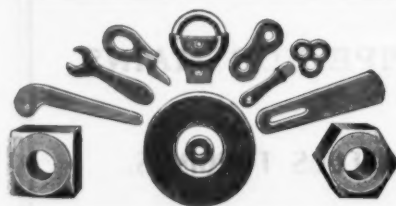
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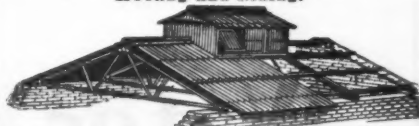
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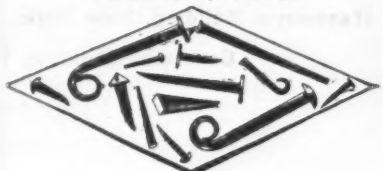
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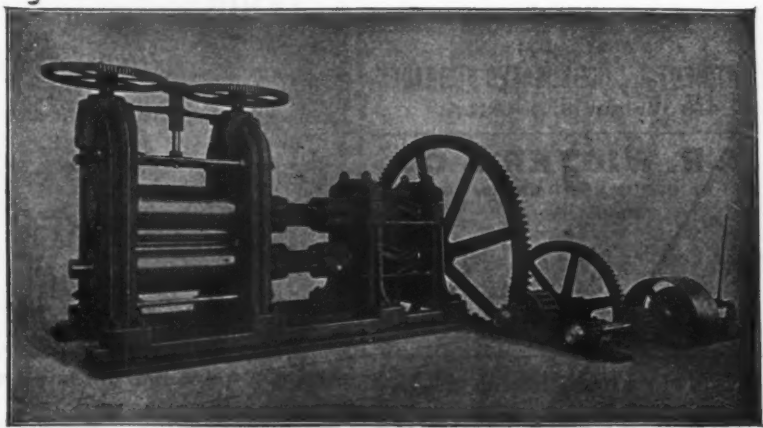
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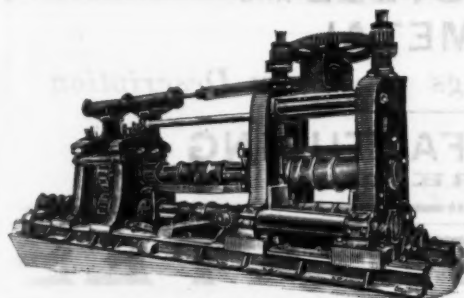
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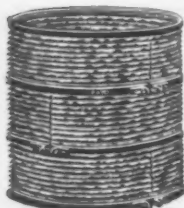
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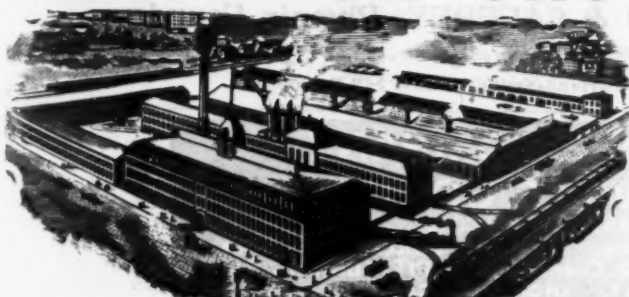
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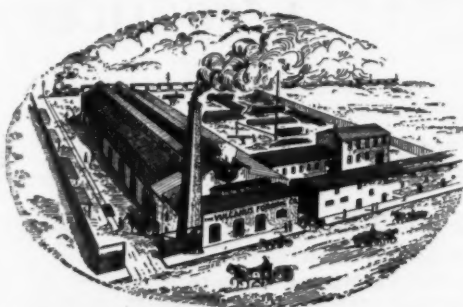
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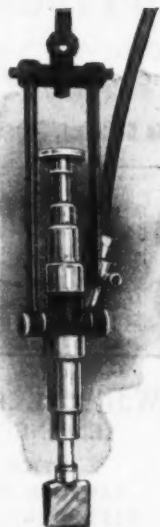
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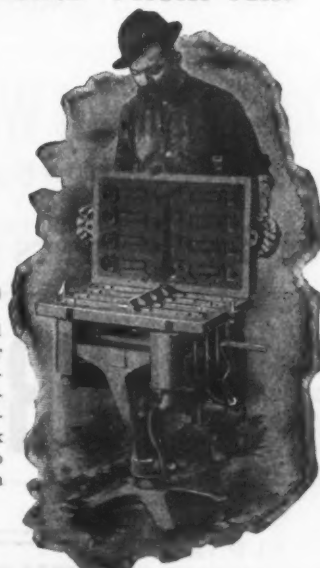
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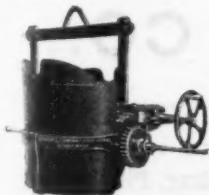
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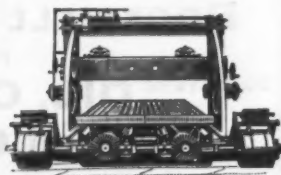


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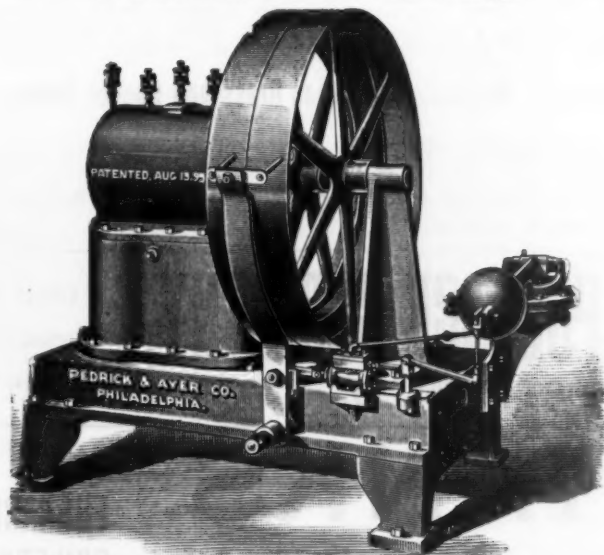
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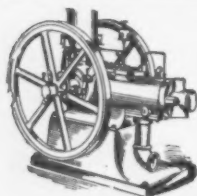
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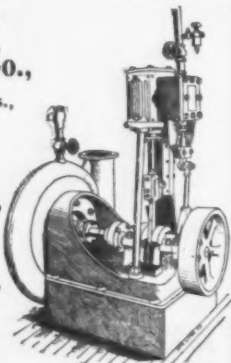
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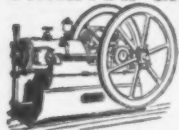
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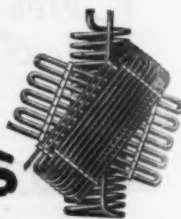
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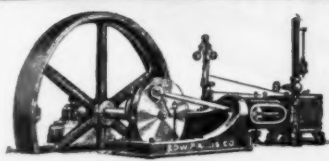
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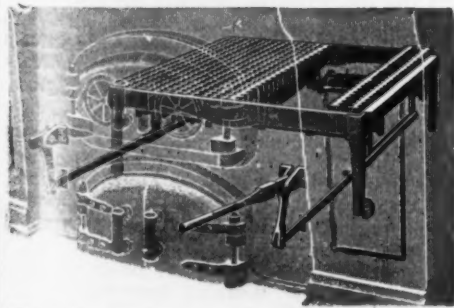
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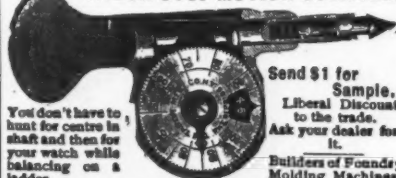


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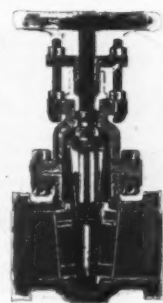
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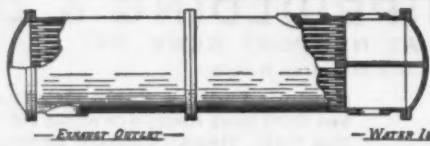
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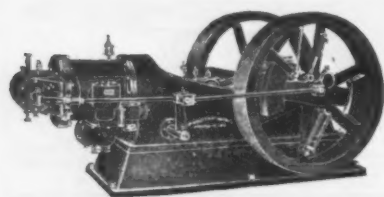


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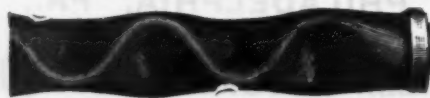
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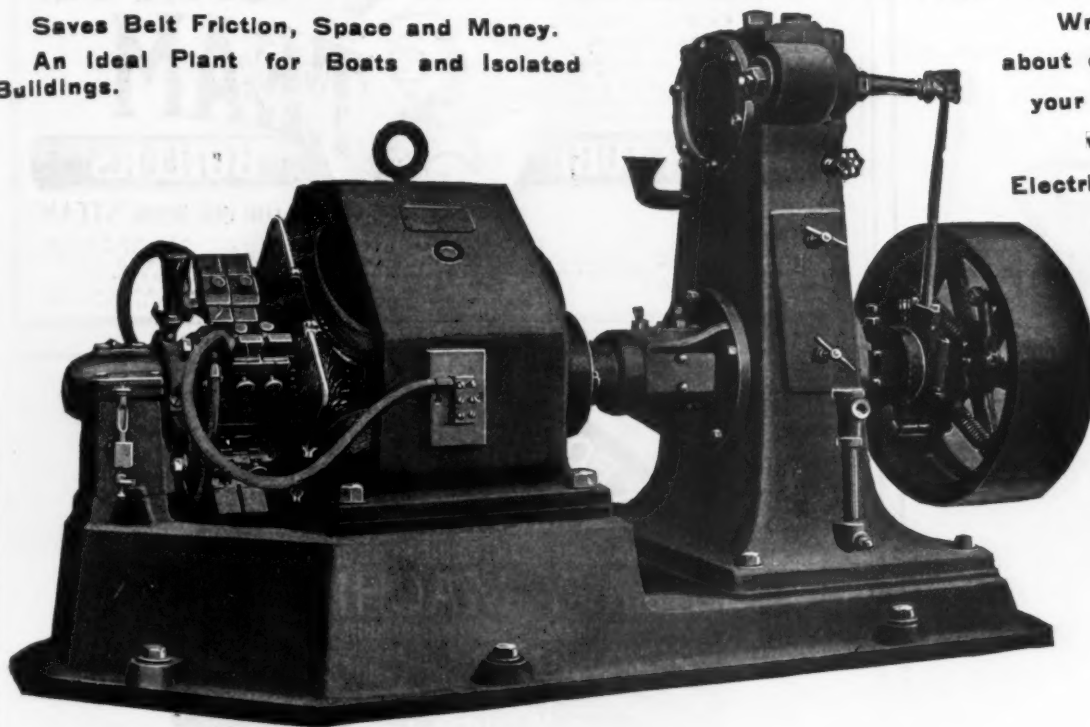
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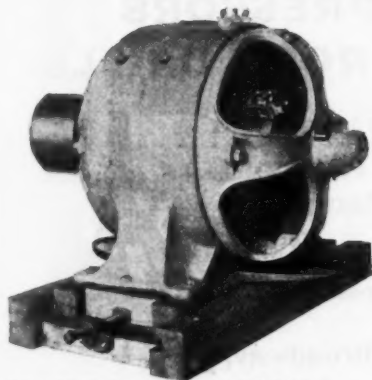


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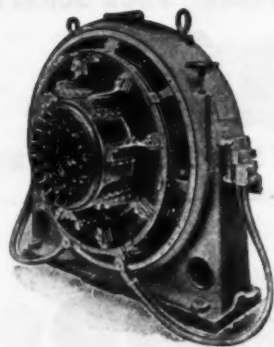
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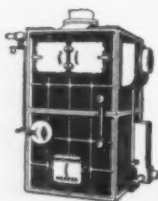
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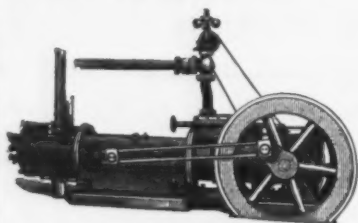
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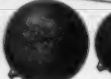


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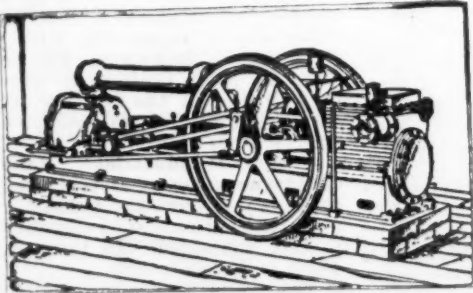
### BALL

### FLOATS

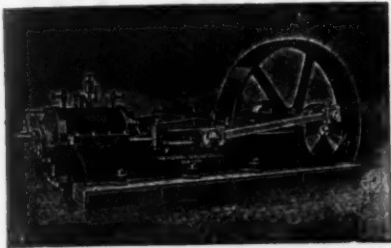
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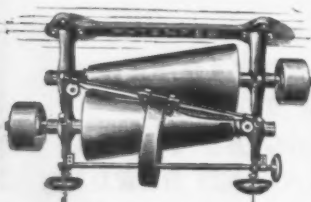
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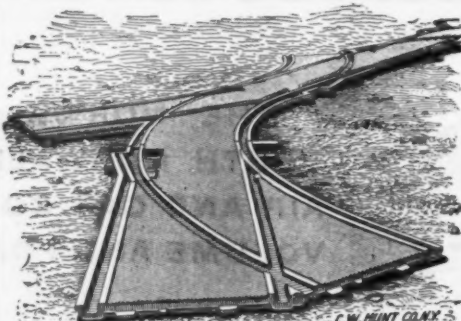


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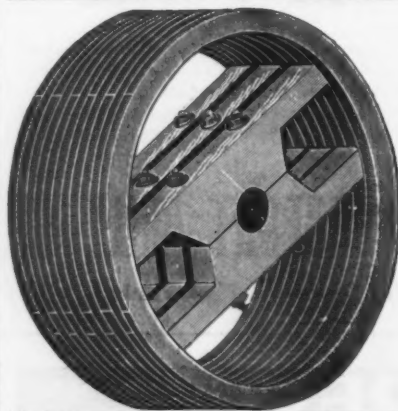
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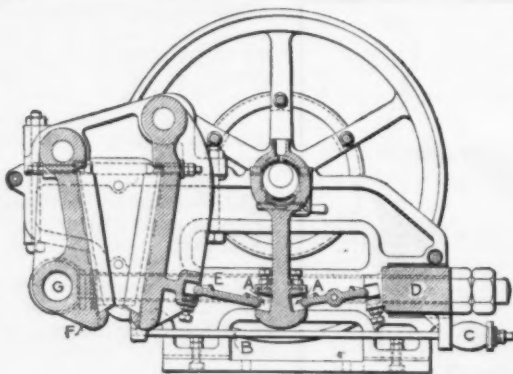


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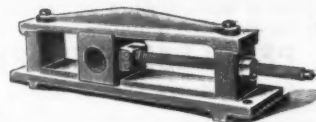
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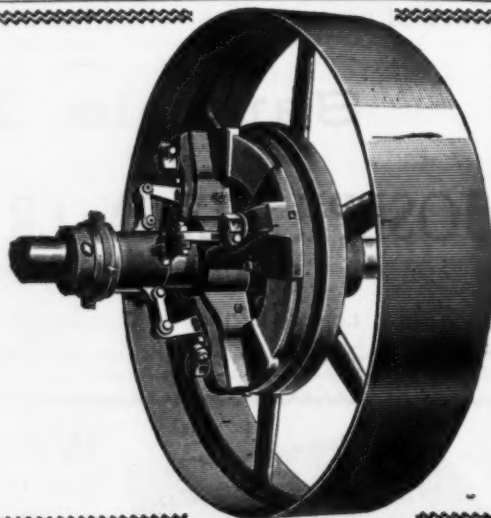
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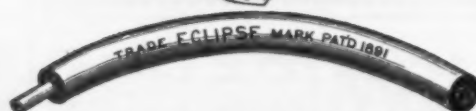


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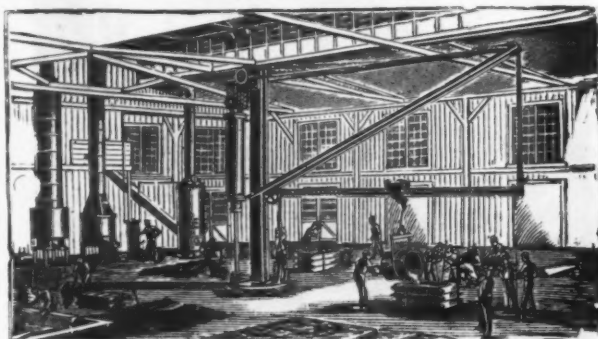
The conditions of a few months ago—those lovely times when your customers approached you on hands and knees with a "Please, good Mr. Iron Man, when can we have the stuff?" Don't do that in these sunny dog day times, do they? It's now that same old song you listened to for seven long years after 1892, to wit: "Sharpen your pencil, old man, and figger down to the inch bone if you want the order to-day."

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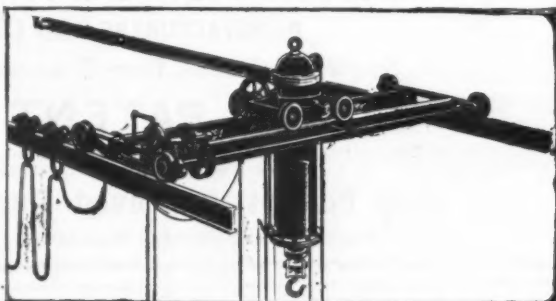
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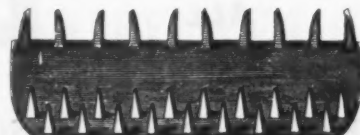
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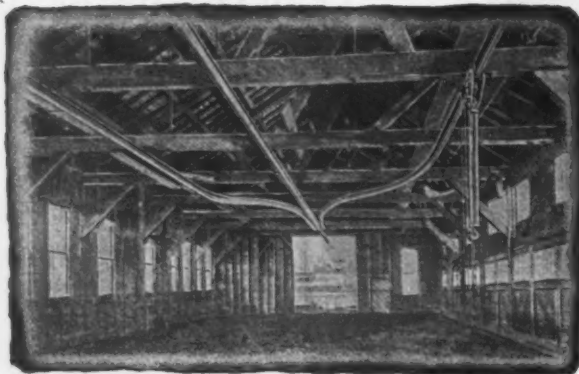
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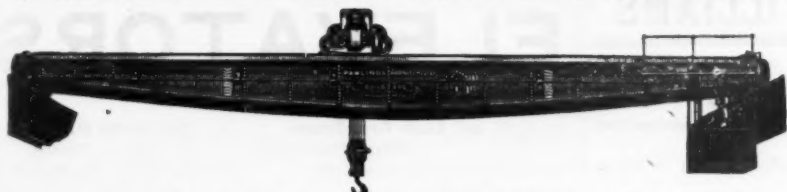
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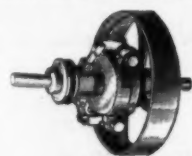
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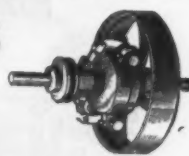
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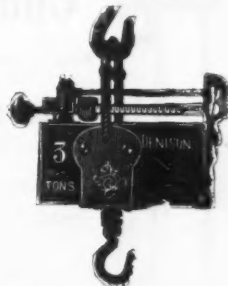
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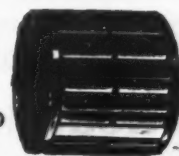
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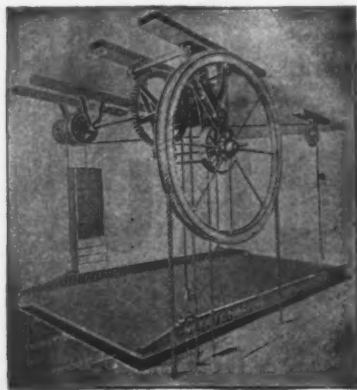
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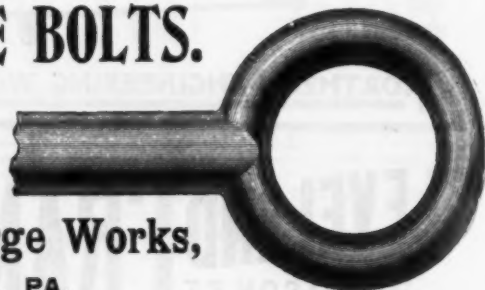
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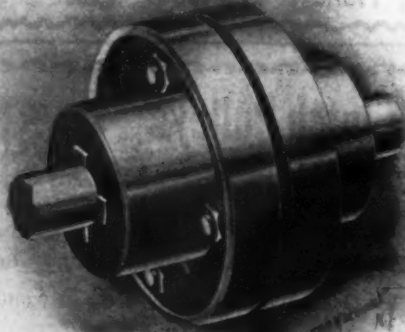
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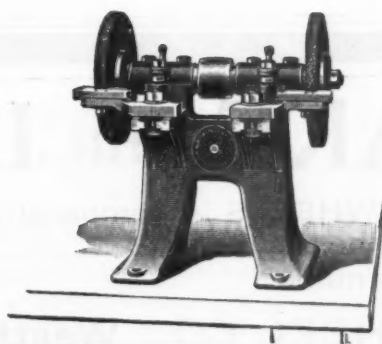
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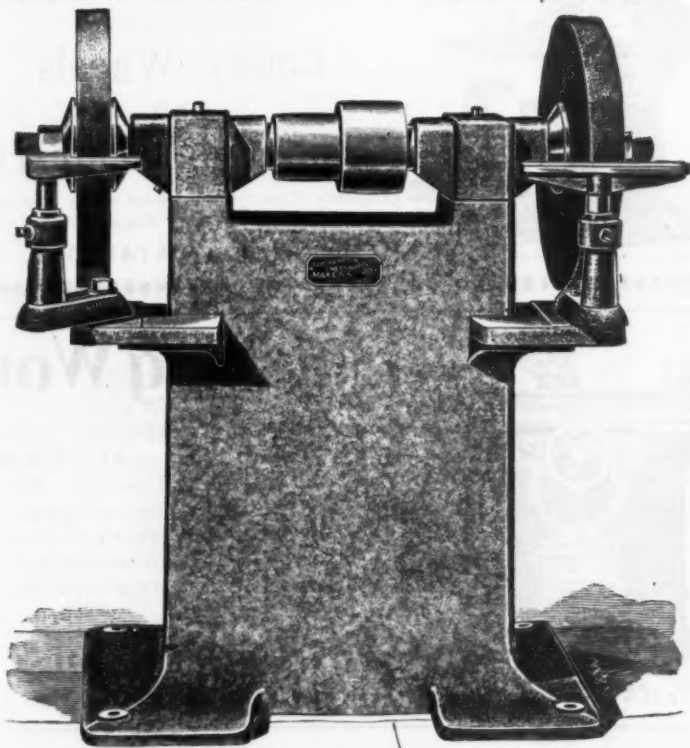
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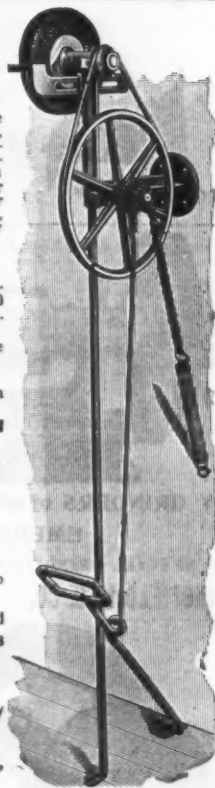
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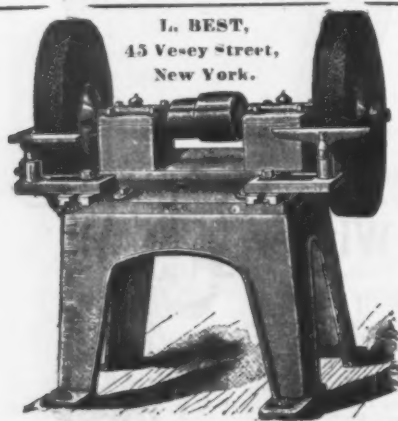
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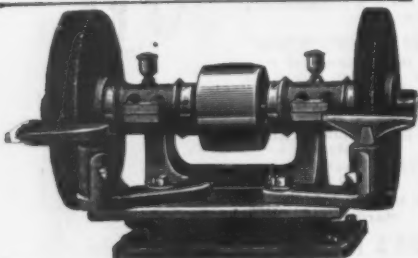
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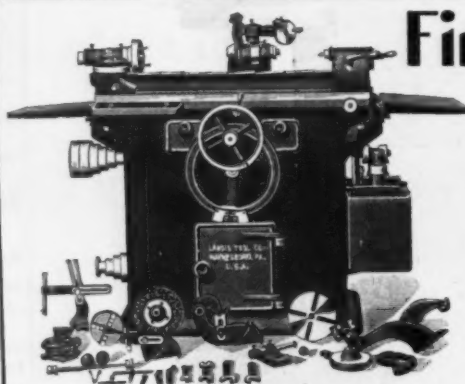
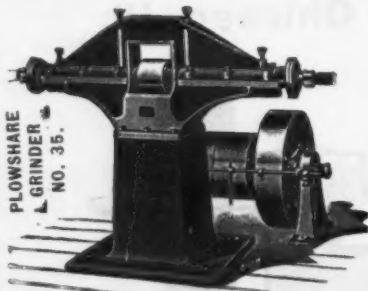
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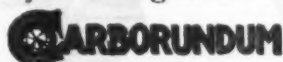
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*Enables the drill to do better and faster work than on any other machine made.*

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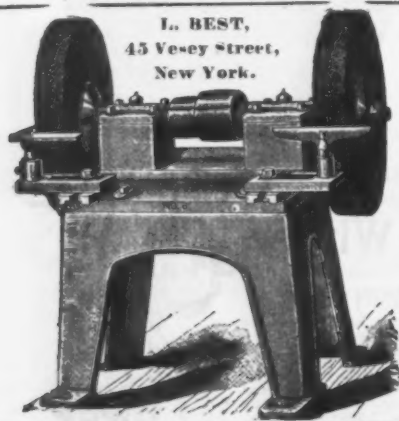
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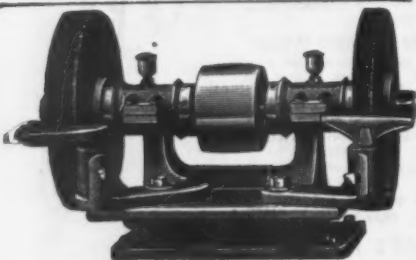
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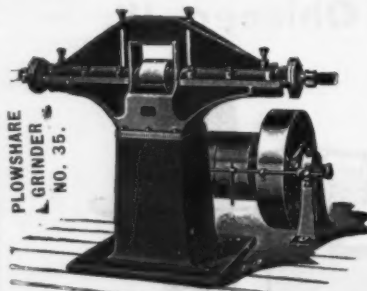
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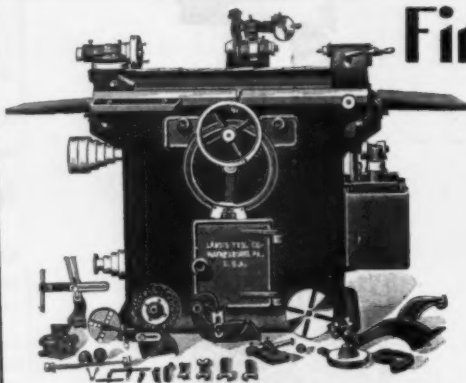
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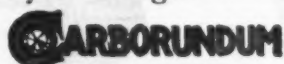
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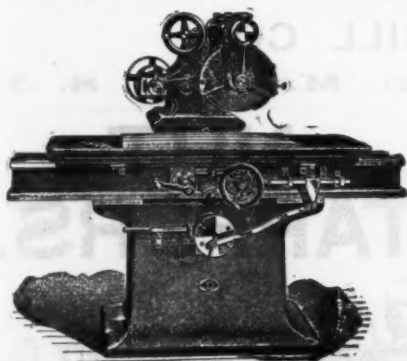
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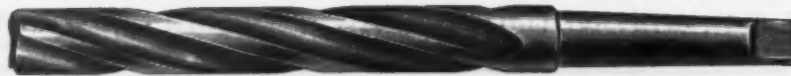
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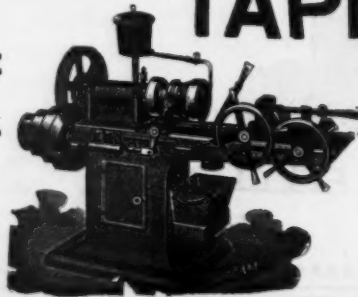
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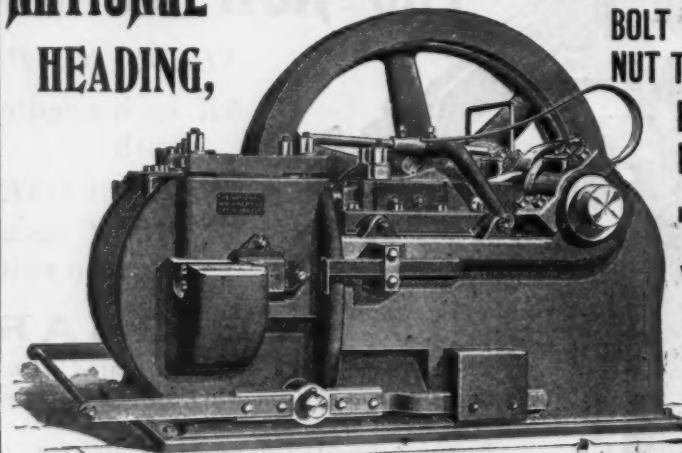
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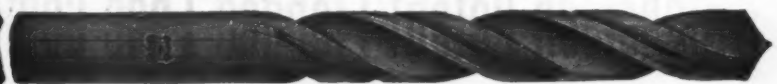
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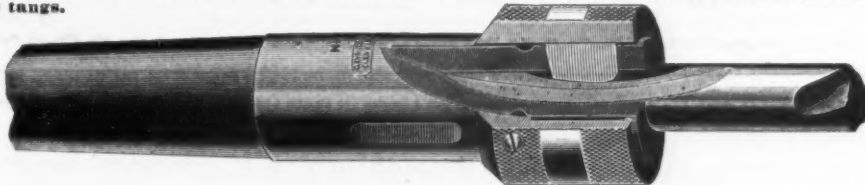


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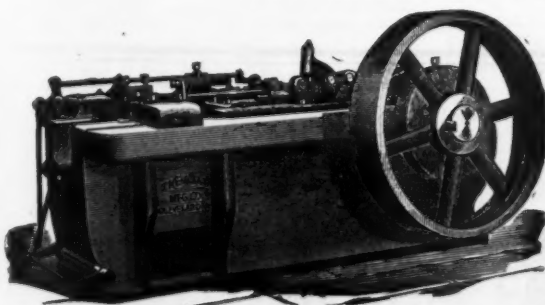
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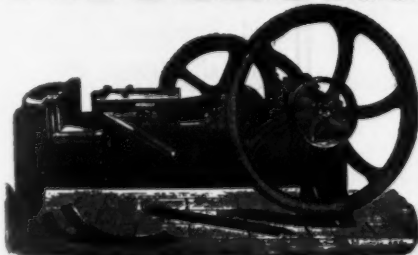
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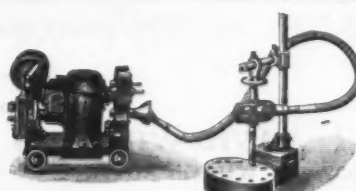
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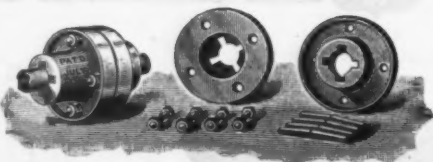


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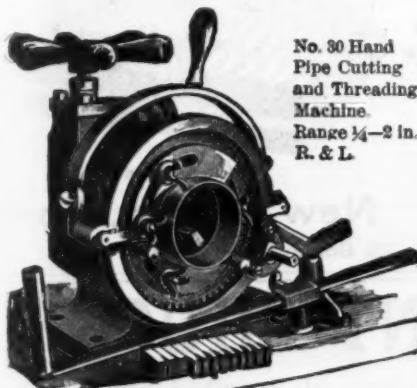
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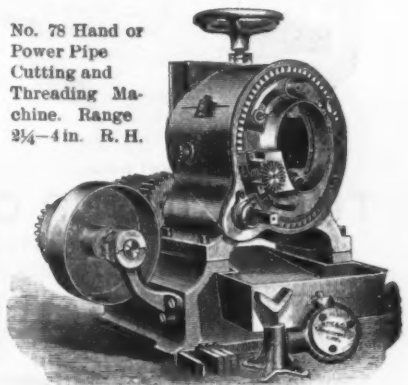
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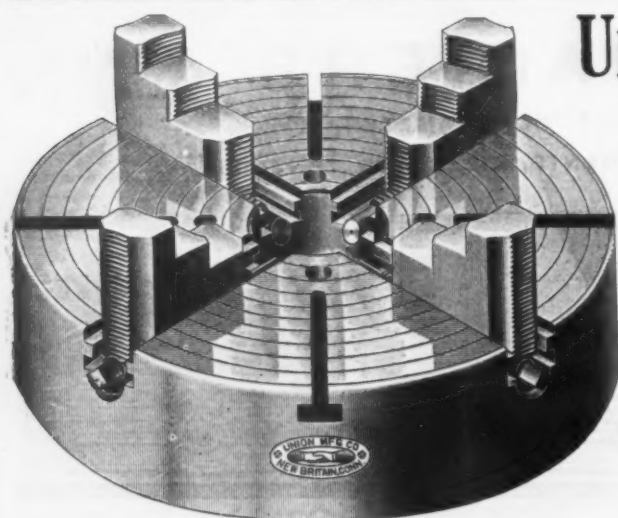
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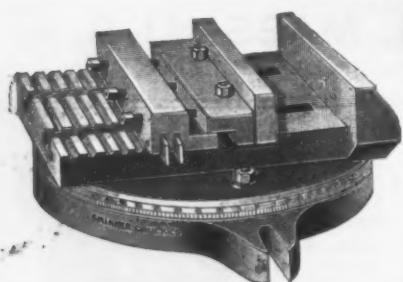
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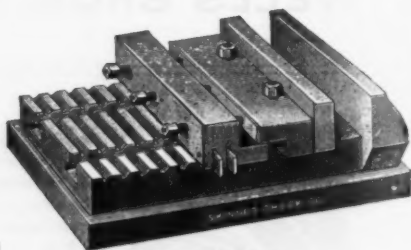


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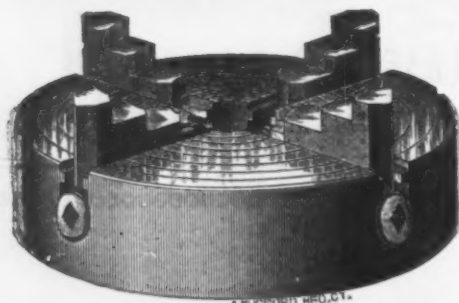
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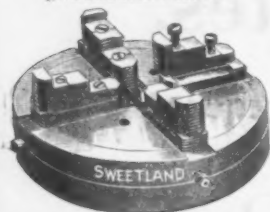


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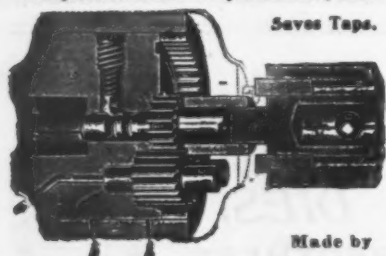
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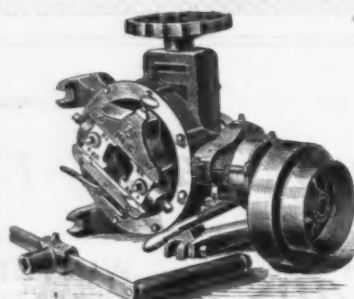
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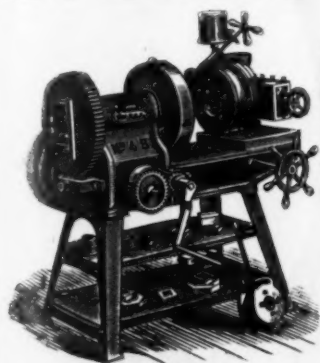
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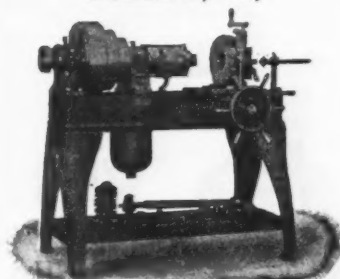
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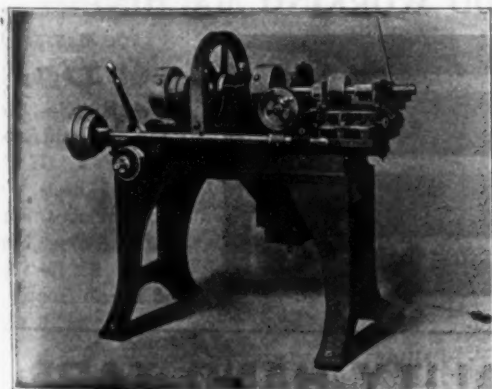
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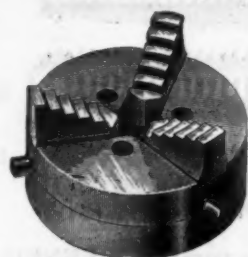
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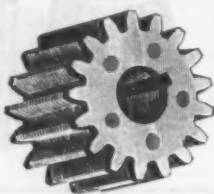
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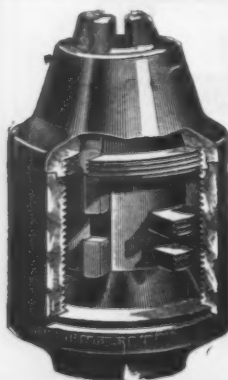
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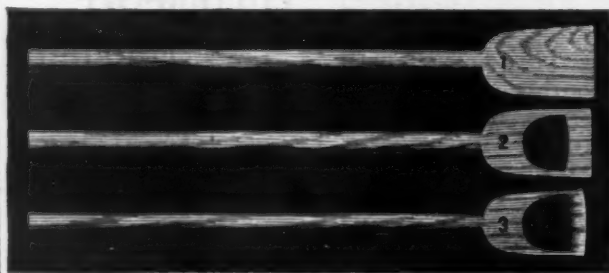
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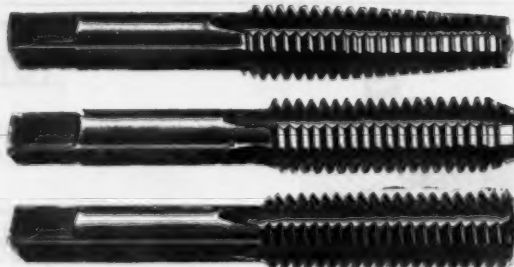
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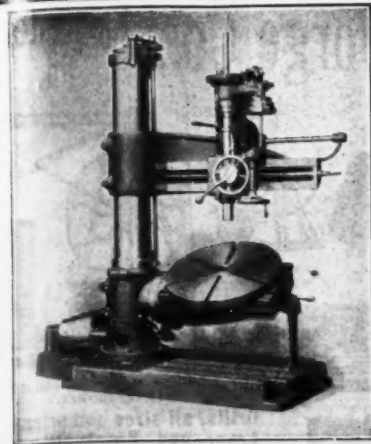
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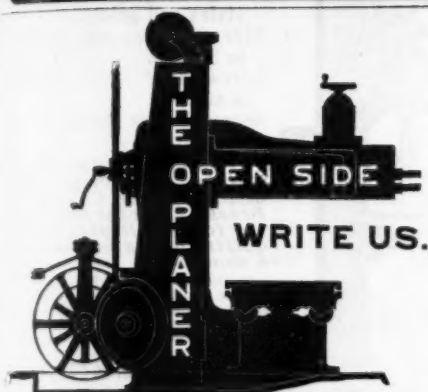
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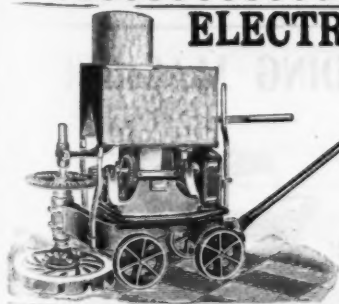
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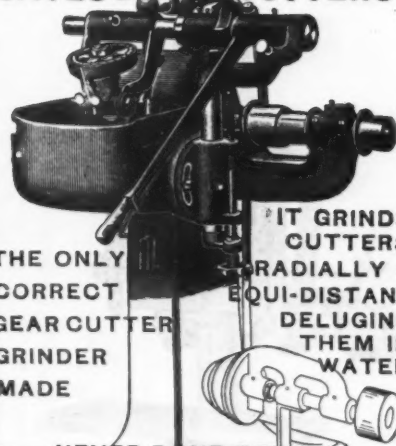
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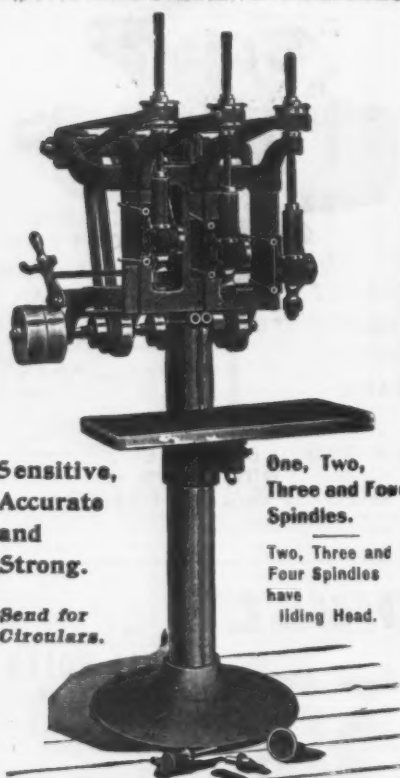
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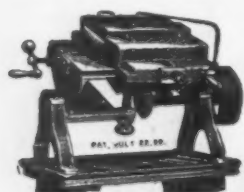
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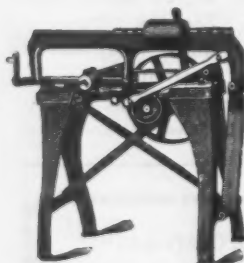
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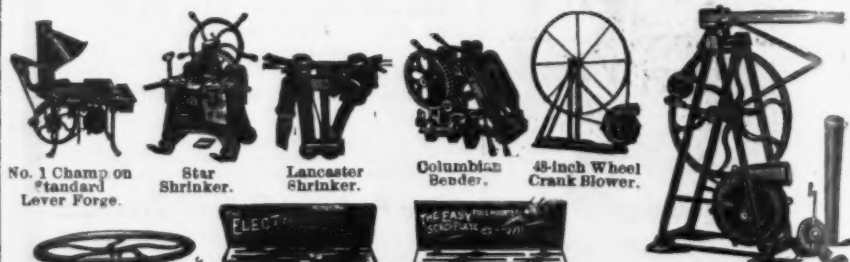
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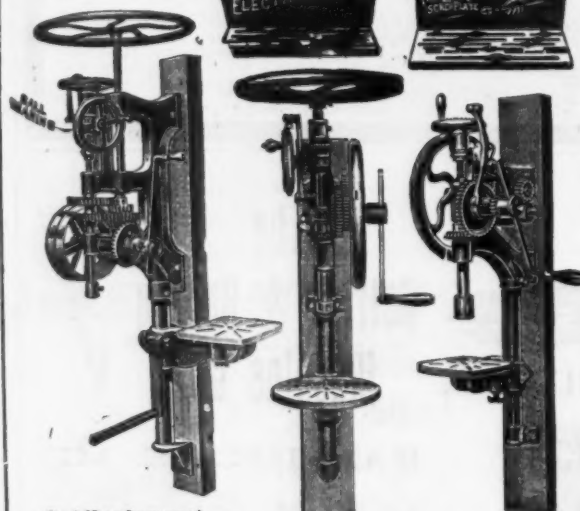
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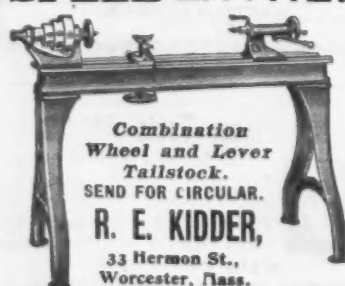
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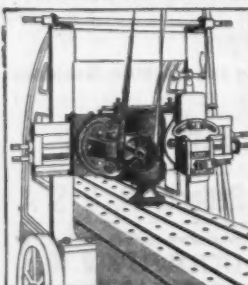
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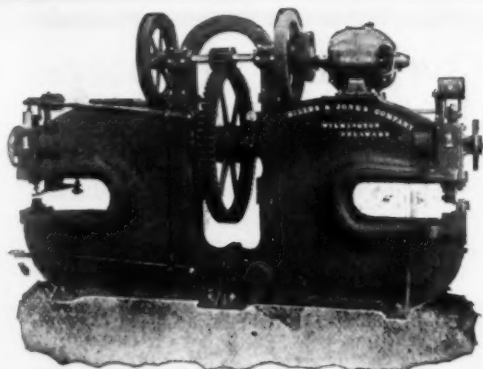
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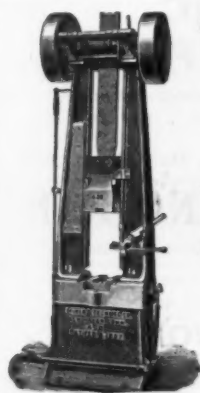
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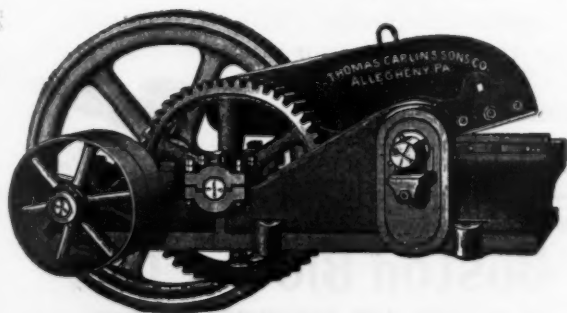
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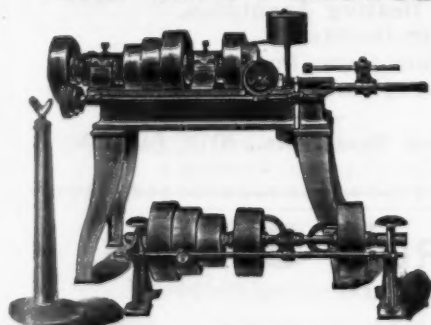
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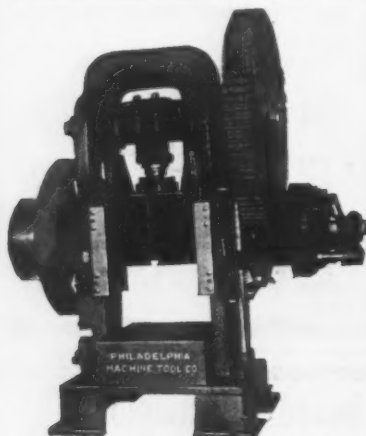
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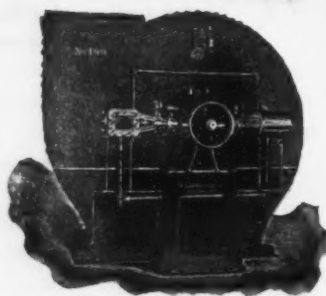


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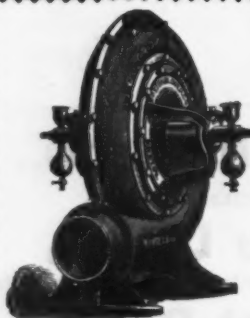
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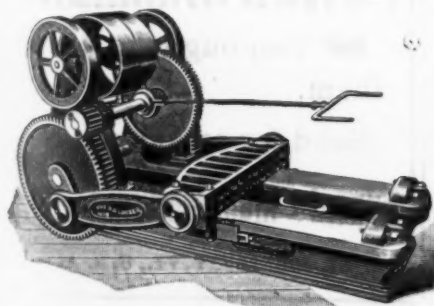
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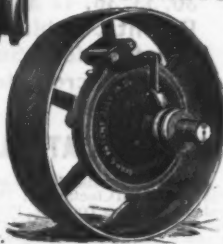
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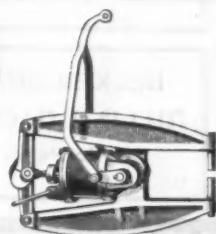
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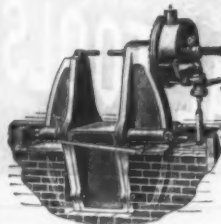
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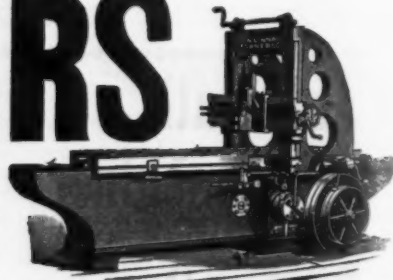
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**Galvanizing and Tinning.**—A book will be issued shortly by the publishers of *The Iron Age*, entitled "Galvanizing and Tinning," devoted to a practical and detailed description of coating with tin and zinc, with a special chapter on tinning gray iron castings, by W. T. Flanders, an expert in this line. These processes have been somewhat secret heretofore on account of the skill of workmanship required and the dearth of information on methods of doing the work. The tools and appliances in use will be described and illustrated.

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line monthly, and effecting a general balance. The methods set forth in this work have been extensively employed by American manufacturers with in many cases certain modifications or changes. C. W. Hunt, formerly president of the American Institute of Mechanical Engineers, in an address before the members of the institute strongly recommended this work and has adopted the Lewis system very largely in the accounts at the works of the C. W. Hunt Company, W. New Brighton, N. Y. This work is sold at... \$12.00

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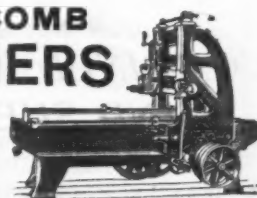
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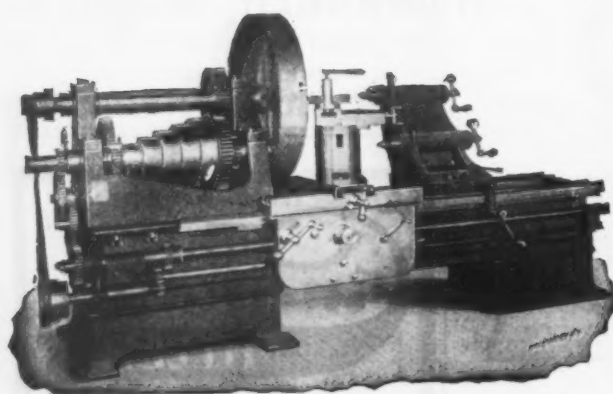
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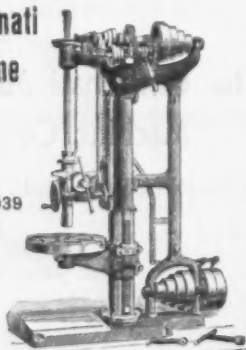
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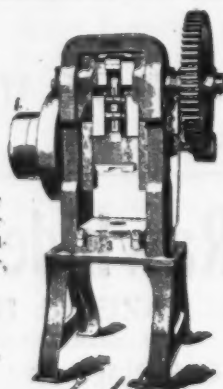
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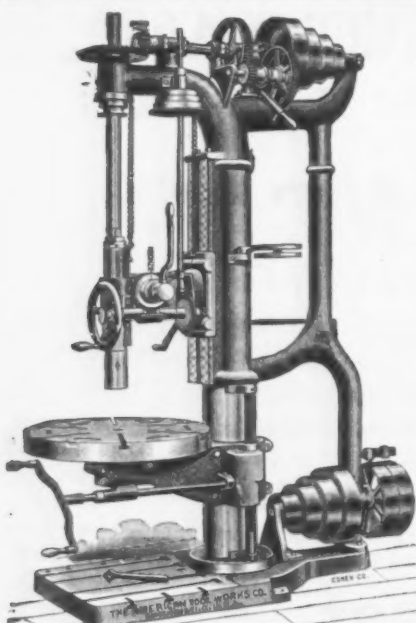
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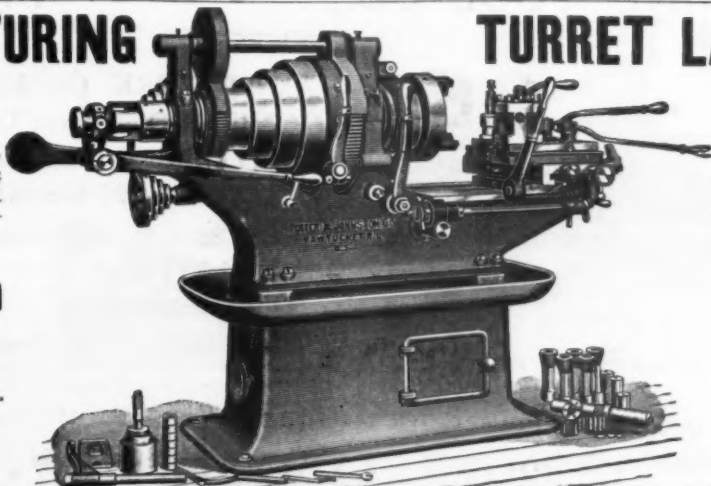
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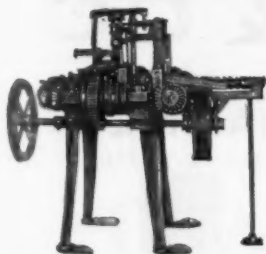
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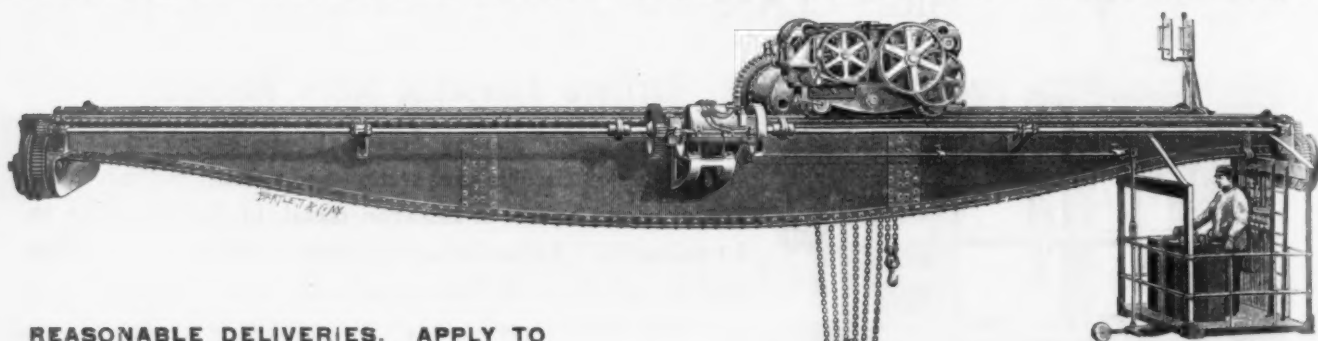
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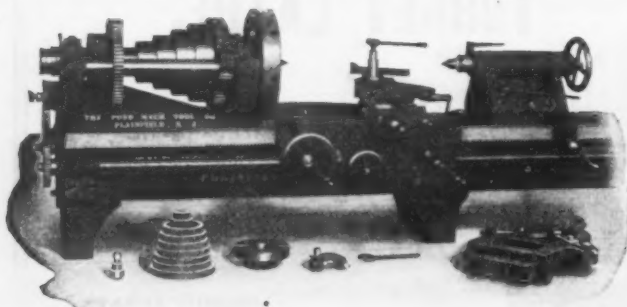
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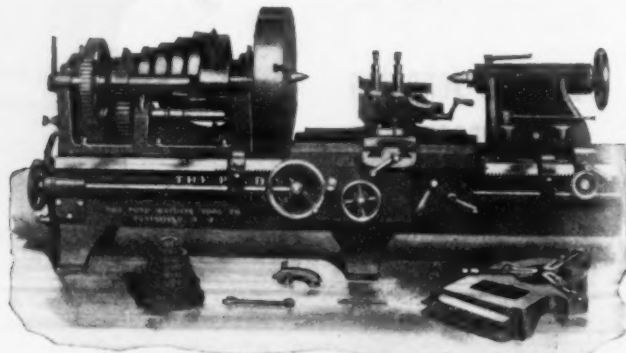
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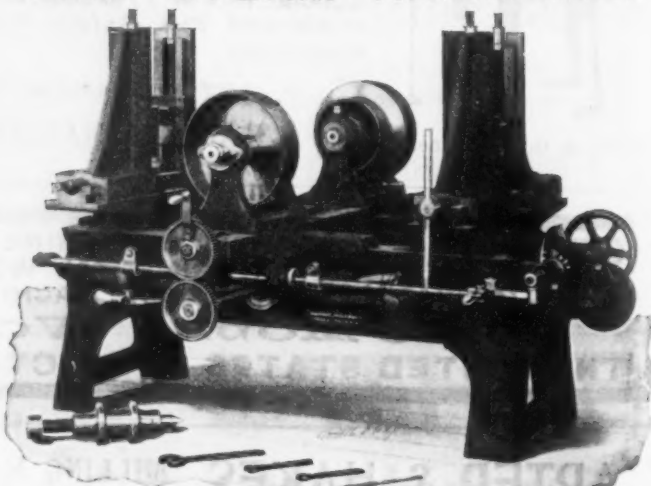
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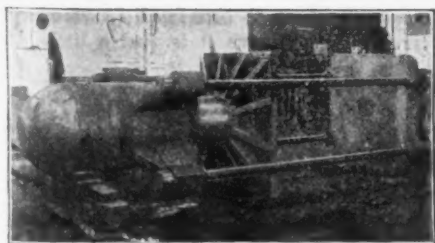
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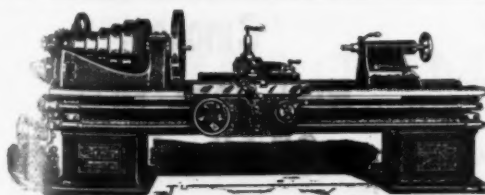
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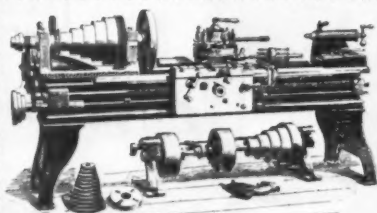
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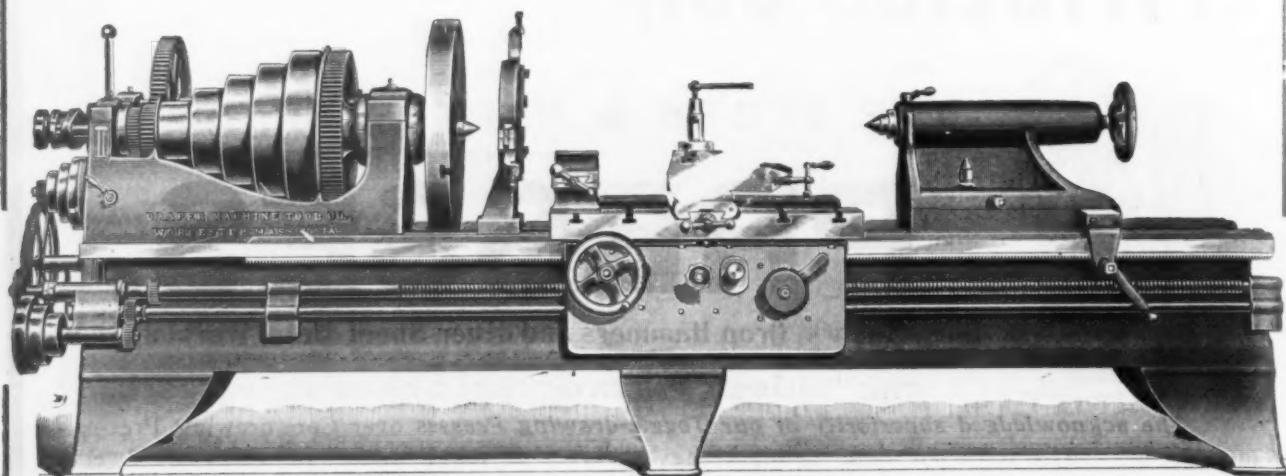
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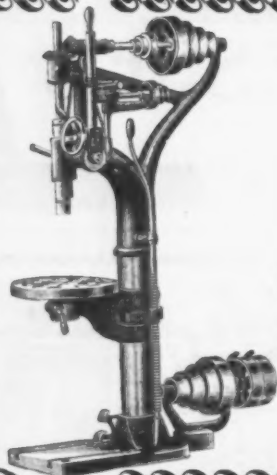
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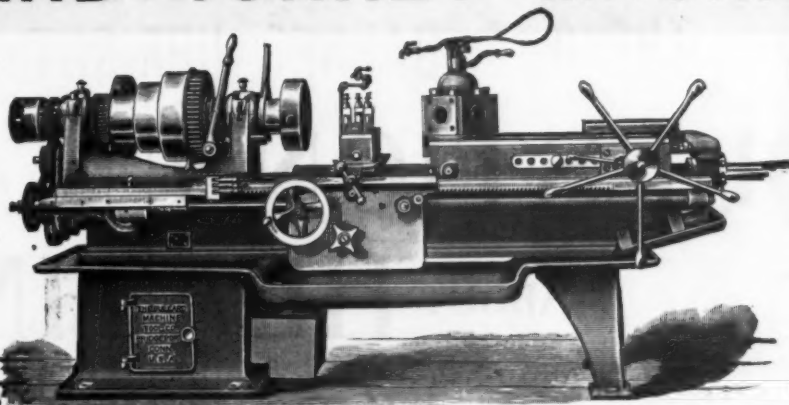
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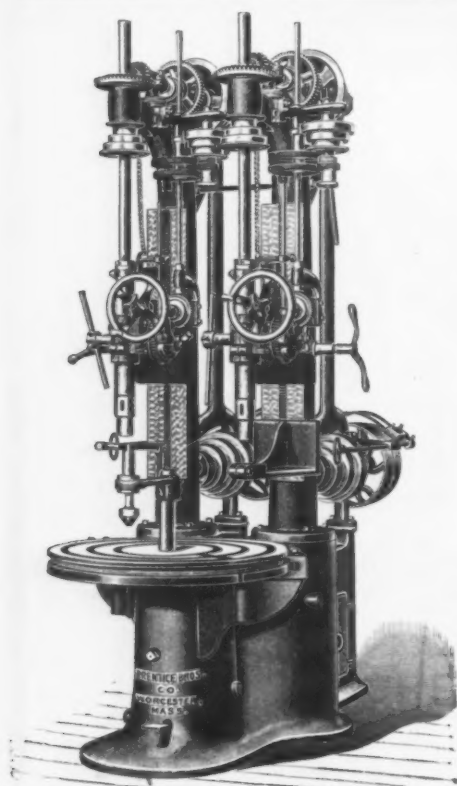
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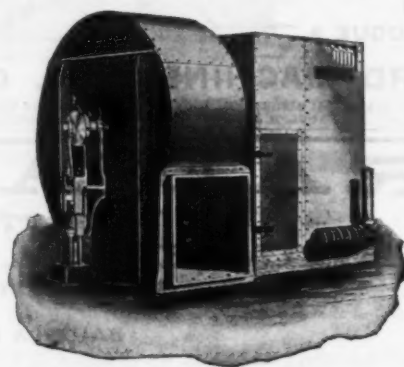
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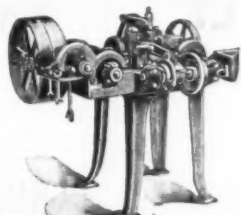
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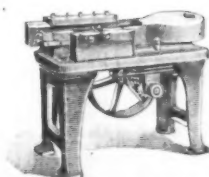




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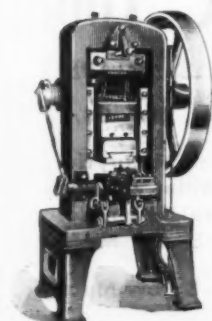
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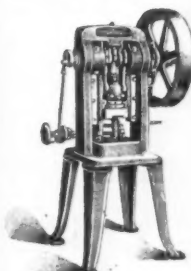
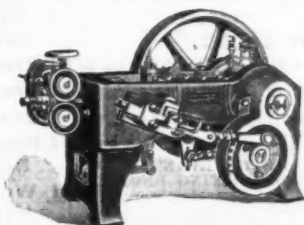


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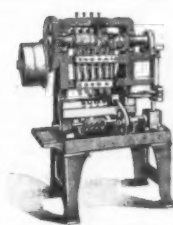
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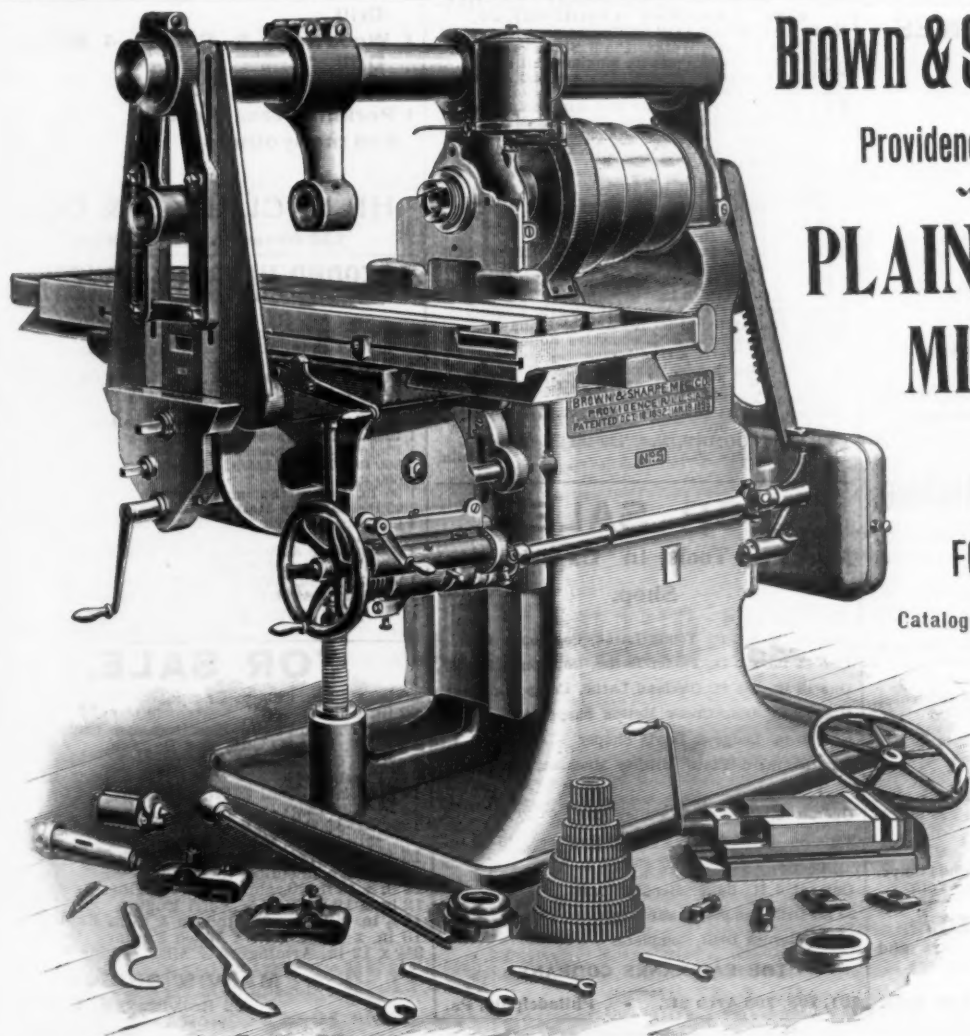
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**NEW MACHINES FOR IMMEDIATE DELIVERY.**  
Erie Engine Works, Plain Slide Valve Automatic and Portable Engines, all sizes.  
Rahn Lathes, Turrets, Planers and Shapers.  
Aurora Drill Presses.  
Reilly Steam Pumps and Air Compressors.  
Centrifugal Pumps and Dredging Machines.  
Hoisting Engines and Contractors' Outfits.  
**SECOND-HAND MACHINERY IN STOCK.**

1 28 in. x 48 in. Corliss Engine.  
1 26 in. x 60 in. " "  
1 22 in. x 42 in. Putnam " "  
1 16 in. x 42 in. Harris Corliss Engine.  
1 14 in. x 28 in. Phila. " "  
1 12 in. x 24 in. Buckeye Engine.  
1 18 in. x 24 in. Porter & Hamilton Heavy Slide Valve Engine.  
1 14 in. x 24 in. x 14 in. Westinghouse Comp. Eng.  
1 18 in. x 30 in. x 6 in. " "  
50 to 200 H.P. High Speed Automatic Engine.  
40, 60, 80 and 100 H.P. Horizontal Boilers.  
20, 25, 30 and 75 H.P. Locomotive Boilers.  
5 to 50 H.P. Vertical Boilers.  
50 H.P. Babcock and Wilcox Boiler.  
Large stock of Steam and Centrifugal Pumps, Lathes, Planers, Shapers, Drills, Milling Machines, Radial Drills, Punches, Shears, Dynamos and Motors, etc.  
FRANK TOOMEY, Nos. 129-131 N. Third St. Phila.  
L. D. Telephone 262.

**FOR SALE.**

**Machine Tools In Experimental  
Shop.**

One 10 in. x 5 ft. Young Lathe, Compound Rest.  
One 14 in. x 6 ft. Porter Lathe, Compound Rest.  
One 18 in. x 8 ft. Oakland Lathe, Compound Rest.  
One 18 in. Ohio Crank Motion Shaper.  
One 20 in. Lodge & Davis Shaper.  
One Brainard Plain Milling Machine, Automatic Feed.  
One 30 in. Pond Style Pulley Lathe.  
Two No. 2 Wire Screw Feed Machines, 15-16 capacity.  
One set 6 ft. Boiler Bending Rolls.  
20 in. Drill complete, auto. feed.  
26 in. Barnes Drill, complete.

**THE FAIRBANKS COMPANY,**

701, 703, 705 Arch St., - Philadelphia, Pa.

**New and Second-Hand  
Machine Tools.****HARRINGTON SUSPENSION  
DRILL No. 1.****USED ONLY THREE MONTHS.**

**The Lodge & Shipley  
Machine Tool Co.,  
Cincinnati, Ohio, U. S. A.**

**Second-Hand  
Machine Tools****IN FIRST-CLASS SHAPE.**

1 Brainard Miller, No. 26, with centres.  
1 Brainard Standard Miller, No. 4½.  
1 Brainard Hand Miller, small size.  
1 Brainard Universal Miller, No. 15.  
1 Pratt & Whitney Screw Machine, No. 1.  
1 Wells Bros. Aut. Screw Machine, ½ inch.  
1 Prentice 21 inch Drill, B. C.  
1 Woodward & Rogers 2 Spindle Drill.  
1 Woodward & Rogers 4 Spindle Drill.  
1 Perkins Press, No. 4.  
1 Perkins Press, No. 5.  
And many others.

**HILL, CLARKE & CO.,  
156 Oliver St., Boston, Mass.**

**SECOND-HAND MACHINERY.**

1 62 in. x 60 in. x 22 ft. Planer.  
1 48 in. x 48 in. x 14 ft. New Haven Planer.  
1 30 in. x 30 in. x 8 ft. Planer, A1.  
1 54 in. x 24 ft. 6 in. Rod Feed Lathe, Cheap.  
1 38 in. x 12 ft. Triple geared Lathe.  
1 12 in. Crank Shaper, Cheap.  
1 14 in. x 42 in. Morgan Steam Hammer.  
1 1200 lb. Morgan Steam Hammer.  
1 Plate Planer, planes 15 ft. long.  
1 800 lbs. Merrill Drop.  
2 600 lbs. " "  
1 60 lb. Delnett Spring Hammer.  
1 25 lbs. Bradley Helve Hammer.  
1 Combined Punch and Shear, cuts and punches 4 in.  
1 Eaton, Cole & Burnham 6 in. Pipe Cutter.  
1 Sand blast outfit complete.  
1 20 in. x 42 in. Wright latest Improved Engine.  
1 200 H.P. Berryman Feed Water Heater.  
**NEW YORK MACHINERY DEPOT.**  
Office, 178 Broadway, N. Y.

**FOR SALE.**

36 in. x 72 in. Corliss Engine, 50-ton Wheel.  
32 in. x 60 in. " " 30 " "  
250 H. P. Compound Westinghouse Engine.  
50 K. W. Direct Connected Dynamo.  
Surface Condensers.  
Jet Condensers.  
16 in. x 16 in. Ball & Wood Engine.  
15 in. x 16 in. " "  
18½ in. x 31 in. x 18 in. Cross Compound Armstrong & Sims Engine.  
15 in. x 14 in. Erie Automatic Engine for direct connection to Dynamo.  
14 in. x 16 in. Straight Line Engine.  
12 in. x 12 in. Ball & Wood Engine.  
10½ in. x 12 in. Armstrong & Sims Engine.  
10 in. x 12 in. Ball & Wood Engine.  
9½ x 12 in. Armstrong & Sims Engine.

**MARVIN BRIGGS,**

12 Broadway, N. Y. City



## Second-hand Machinery

### ENGINE LATHES.

112 in. x 4 ft. Pond, R. & F.  
112 in. x 5 ft. Young, plain.  
112 in. x 6 ft. Blaisdell, L. & F.  
114 in. x 5 ft. Putnam, R. & F. W. C.  
114 in. x 7 ft. 6 in. Putnam, R. & F. W. C.  
114 in. x 6 ft. Porter, R. & F.  
114 in. x 5 ft. Robbins, R. & F.  
216 in. x 6 ft. Ames, special features.  
218 in. x 6 ft. Fuller, R. & F.  
218 in. x 8 ft. Fuller, R. & F.  
118 in. x 8 ft. Fitchburg, comp. rest.  
20 in. x 14 ft. Chamberlain, "old style."  
128 in. x 10 ft. White, taper, "old style."  
127 in. x 10 ft. D. W. Pond, comp. rest.  
128 in. x 12 ft. W. L. & Co., comp. rest.  
27 in. x 12 ft. W. L. & Co., plain back gear turning.  
28 in. x 16 ft. Ditto.  
136 in. x 16 ft. back gear turning.  
140 in. x 16 ft. plain turning.

### SPEED LATHES.

212 in. x 5 ft. B. G. Speed.  
111 in. x 4 ft.  
122 in. x 9 ft.

### PLANERS.

224 in. x 24 in. x 4 ft. W. & L.  
128 in. x 28 in. x 8 ft. Gay & Silver.  
130 in. x 30 in. x 6 ft. White.

### PRASSES.

1 No. 3 C. & M. Single.  
1 No. 14 Stiles, heavy special.  
1 No. 5 Blake & Johnson, arch.  
1 No. 82 S. & F. Foot.

Large stock new machines. Prices on application.

Two 20-ton Hand Traveling Cranes, 58 ft. 10 in. span.

**THE NILES TOOL WORKS CO.,**  
136-138 LIBERTY STREET, NEW YORK CITY.

## FOR SALE.

### Mill and Contractors' Machinery.

1 25 ton Morgan Square Shaft 50 ft. span traveling crane.  
2 Hydraulic Cranes.  
1 Roll Lathe.  
1 Hydraulic Press.

### Machine Tools For Sale.

1 12 in. Fitchburg Shaper, sliding head.  
1 9-in. Gould Shaper.

### Engines and Pumps For Sale

1 30 x 36 in. Vertical Corliss Rolling Mill Engine with 20 ft. fly wheel.  
4 Second-hand Steam Pumps.  
1 Centrifugal Pump.  
1 Second-hand Hoisting Engine.  
A full line of New Engines, Hoisting Engines, Shears, Grinding Pans, Stone Crushers and Contractors' Machinery.

THOMAS CARLIN'S SONS CO.,

786 River Avenue, Allegheny, Pa.

### IMMEDIATE DELIVERY.

12 Plain Vertical Engines, 3 to 50 H.P.  
Plain Horizontal Engines, 10 to 150 H.P.  
Automatic Engines, 5 to 800 H.P.  
Direct Connected Engines, 25 to 800 H.P.  
High grade and maximum efficiency.  
Hoisting Engines from 6 to 50 H.P., single and double cylinders and drums.  
10 20 in. Lever and Wheel Feed Drill Presses.  
10 20 H.P. Boiler Feed Pumps.

PENNSYLVANIA MACHINERY CO.,

The Bourse, Philadelphia.

### WATCH CASE FACTORY FOR SALE IN LOTS TO SUIT.

Consisting of Engine Turning and Spinning Lathes of foreign and domestic manufacture; Fournier Jointing Lathe, Ecanbert Bench Lathes, 100-ton Hydraulic Embossing Press, with 3 piston pump; 6 rolling mills, Turret and Square Arbor Lathes, draw in chucks, Gas Annealing, Hardening and Melting Furnaces, etc., etc. Full particulars on application to S. T. LUND, 77 Oliver St., Boston, Mass.

## 2 BERRYMAN HEATERS.

2nd HAND. LARGE AND SMALL.  
F. L. PATTERSON, 136 Liberty St., N. Y.

## BOILERS AND ENGINES.

1 125 H. P. 66 in. x 18 ft. Horizontal Tubular.  
1 100 H. P. 66 in. x 16 ft. Horizontal Tubular.  
2 80 H. P. 60 in. x 16 ft. Hor. Tubular.  
1 40 H. P. Economic Portable.  
1 50 H. P. 48 in. x 10 ft. Vertical.  
1 32 H. P. 44 in. x 9 ft. 6 in. Vertical.  
1 20 H. P. 42 in. x 7 ft. Vertical.  
1 215 H. P. Cross Compound Condensing. Extra fine.  
1 100 H. P. 14 in. x 48 in. Corliss.  
1 80 H. P. 16 in. x 30 in. Slide Valve.  
1 60 H. P. 14 in. x 26 in. Rolling.  
1 60 H. P. 14 in. x 24 in. Vertical. Fine.

1 20 H. P. 9 in. x 12 in. Slide Valve.  
1 30 H. P. 10 in. x 24 in. Slide Valve.  
2 5 H. P. 5 in. x 6 in. Vertical.  
2 50 H. P. Dbl. cyl. dbl. drum Dickson Hoisting Engines.  
2 15 H. P. Single cyl. single drum Quarry Hoists.  
1 5 H. P. Rotary Hoisting Engine.  
1 150 H. P. Feed Water Heater.  
2 80 H. P. Steam Stamp Mills.  
Steam Hammers, Steam Pumps, Blowers and Fans, Cranes, Tools.

Write for prices.

THOMAS P. CONARD,

119 So. Fourth St., Phila.

### "As Good As New." Boilers.

2 250 H. P. Sterling Water Tubes for 150 lbs.  
1 150 H. P. Sterling Water Tubes for 150 lbs.  
2 200 H. P. National Water Tubes for 125 lbs.  
8 72 in. x 17 ft. Return Tubulars for 120 lbs.

### Engines.

19 in. x 35 in. x 48 in. Tandem Cpd. Greene.  
26 in. x 60 in. Harris Corliss.  
26 in. x 48 in. Allis Corliss.  
18 in. x 42 in. Knowlson & Kelly Corliss.  
14 in. x 24 in. x 14 in. Comp'd Westinghouse.  
11 in. x 19 in. x 24 in. Tandem Buckeye.

2 600 H. P. Snow Condensers.  
1 600 H. P. Nordberg.

### Rossiter, McGovern & Co.,

141 Broadway, N. Y. Factory, Brooklyn, N. Y.

## FOR SALE.

Two New Return Tubular Boilers, 125 H. P. each, built by Wetherill & Co.  
500 ft. 12 inch Cast Iron Bell Pipe.  
Several large Iron Tanks, round and square.  
300 New Sugar House Wagons.

J. H. McCURE & SON,

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### FOR SALE.

60 and 80 lb. Bradley Hammers.  
No. 6 Root Blower.  
No. 3 Bell Steam Hammer.  
110 in. Box Radial Drill.  
80 in. " " " " very heavy.  
15 in. Pratt & Whitney Crank Shaper.  
13 in. x 5 ft. Pratt & Whitney Tool Lathe.  
25 in. Horizontal Boring Machine.  
27 in. x 8 ft. Fitchburg Planer.  
36 in. x 14 ft.  
DAWSON & GOODWIN, 41 So. Canal St., Chicago.

## 2d HAND FEED WATER HEATERS.

Largest stock in America. Will be sold at bargains. These heaters are mostly taken in exchange for our improved Berryman (Kelley's Patent), "A Little Giant," vastly superior to all other feed water heaters, both as to results and durability.

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### FOR SALE.

Westinghouse Comp. Engine, 50 H. P., \$360. 35 Arc Light, T. H. Dynamo, \$250. No. 4 Delamater Steam Pump, 4 in. suc., \$100. 20 H. P. Locomotive Boiler, \$100.

SCHULTZ & CO.,

Rothschild Bldg., 14 South Broad St., Philadelphia.

## FOR SALE.

# 850 HORSE POWER HEINE

## WATER TUBE BOILERS

TWO 350 H.-P. UNITS.  
ONE 150 H.-P. UNITS.

Complete with McClave Shaking Grates, Breechings, full set of fixtures and trimmings.

May be inspected at West Side Power House, Rockford Edison Company, Rockford, Illinois.

Two 72 x 16 Tubular Boilers, 824 in. flues, breeching and 48 in. x 80 ft. stack, Built 1897. Hartford Insurance at 125 pounds pressure.

Two 66 x 16 Tubular Boilers, 584 in. flues, "A" breeching. Hartford Insurance at 100 pounds pressure.

Four 60 x 16 Tubular Boilers, 444 in. tubes; 100 pounds pressure.

Eight 44 x 16 Tubular Boilers, 324 in. flues, all fixtures and trimmings.

One 1200 H.-P. Berryman Feed Water Heater. Used two months. Built 1898.

### WETHERILL CORLISS.

One right hand Wetherill Corliss Engine, cylinder 28 x 60; flywheel 20 feet diameter, weight 30 tons; shaft 15 in. x 12 ft. 6 in.; rope drive pulley 18 ft. diameter and grooved for 15 2-inch ropes; driven wheel 78 in. diameter grooved for 18 2-inch ropes; two iron idlers with boxes complete. With or without independent Condenser 10x14x16.

W. W. WHITEHEAD,

DAVENPORT, IOWA.

## ENGINES AND BOILERS.

12 x 36 Lane & Bodley Corliss  
14 x 15 Phoenix Automatic  
7 x 7 Payne  
14 x 20 Atlas  
11 x 30 Fitchburg  
13 x 26 Buckeye

Engines.

and others second hand. Also

2 66 x 18 Hor. Tubular Boilers.

2 66 x 16 "

Send for complete list of second-hand machinery.

W. D. NORTON, 6th and Carr Sts., Cincinnati, O.

## FOR SALE.

AT A BARGAIN.

1 Second hand Corliss Engine, 14 in. x 42 in.

1 Blake Stone Crusher, 15 x 9 with screen.

1 Dean Duplex Steam Pump, 5 x 3 1/2 x 5.

3 Edison Diaphragm Pumps.

WM. FLINTOFF, Haverhill St., Boston.

## 2d-Hand Machinery Bargains.

One 18 in. x 42 in. Watts Campbell and 22 in. x 42 in. Wright Corliss Engines. High Speed Automatic, Simple, Compound, Condensing and Slide Valve Engines; also Blowing Engines, Boilers, Heaters, Pumps, Vacuum Pans, Ice Machines, Electric Motors, Generators, Railway Supplies, Metal Working and General Machinery.

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72 Trinity Place, N. Y.

### ENGINES, STATIONARY and MARINE.

2 Eaton and Prince Passenger and Freight Elevators.

2 Upright Marine Engines; also one 14 x 18, and one 12 x 20 Horizontal Engine.

Machinery bought, sold and erected.

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**New and Second-Hand Machinery in Stock.**

68 x 28 Field trip. gd. lathe, new.  
 44 x 26 Field ditto, new.  
 42 x 16 & 16 ft. Lodge & Shipley ditto, new.  
 38 x 23 ft. Fish triple grd. ditto, new.  
 36 x 14 ft. Fish ditto, new.  
 32 x 18 & 22 ft. Pay & Scott lathes, new.  
 31 1/2 x 12, 14 & 16 ft. Davis lathes, new.  
 30 x 14 & 16 ft. Lodge & Shipley lathe, new.  
 25 x 10, 12, 14 & 16 ft. Davis lathes, new.  
 90 x 14 ft. trip. gd. lathe, C. R., good order.  
 40 1/2 x 17 ft. 4 in. I. Johnson lathe, fine order.  
 36 x 16 ft. 6 in. Pond lathe, good order.  
 72 in. Bickford vert. bor. mill, 2 hds., new.  
 90 in. Bickford ditto, 2 hds., new.  
 43 in. Rogers & Hemphill ditto, 2 hds., new.  
 12 ft. Knowlton vertical boring and turning mill, good as new.  
 60 in. Wm. Sellers & Co.'s do., 2 hds., good order.  
 4 in. bar, 8 ft. table, Newark Horiz. boring and drilling machine, power lift, new.  
 56 x 14 Nicholson & Waterman ditto, new.  
 61 x 60 x 24 ft. Hewes and Phillips planer, fine order.  
 80 x 30 x 10 Harrington planer, good order.  
 54 x 48 x 12 ft. L. W. Pond planer, 2 hds., new.  
 42 x 36 x 12 Cincinnati ditto, 2 hds., new.  
 32 x 33 x 10 Cincinnati ditto, new.  
 30 x 30 x 14 ft. Cincinnati ditto, new.  
 30 x 27 x 8 Rochester ditto, new.  
 22 x 22 x 5 L. W. Pond ditto, new.  
 No. 3 6 ft. arm Bickford plain radial drill, new.  
 No. 2 5 ft. arm Bickford tapping radial drill, new.  
 2 36 in. Cincinnati upright drills, B. G. & P. F., new.  
 Pratt & Whitney special 4 spindle double hd. milling machine, practically new.  
 No. 12 and No. 13 B. S. plain millers, fine order.  
 2 No. 6 Brain'd pl'n mills, with c't'rs, good as new.  
 20 ft. hydraulic ship cell tapping mch., fine order.  
 Cincinnati plain and univ. millers, all sizes, new.  
 Prentiss patent shapers, 12 to 32 in. stroke, inclusive, new.  
 Also large assorted stock of other tools. Send for complete list.

**PRENTISS TOOL & SUPPLY CO.,**  
 115 Liberty St., New York, N. Y.  
 Buffalo Office, 804 D. S. Morgan Bldg.

**Chuckling Machines.**

Plain and Friction Heads.

- 5 14 in. Plain, 1 5-16 hollow spindle.
- 1 14 in. friction geared, 1 1/2 hollow spindle.
- 2 16 in. " " 1 5-16 hollow spindle.
- 3 16 in. " " 1 1/2 " "
- Pratt & Whitney make. Condition A1.

**A. B. Pitkin Machinery Co.,**  
 PROVIDENCE, R. I.

**SECOND-HAND BOILERS AND ENGINES**

For Immediate Delivery.

- 1 50 in. x 12 ft. Woodbury Boiler, 58 3-in. tubes, no dome, half arch front and fixtures except stack, good order.
  - 2 46 in. x 13 ft. Syracuse Boilers, 46 3-in. tubes, no dome, full front, usual fixtures except stack, fair order.
  - 1 30 in. x 8 ft. Woodbury Boiler, 15 3-in. tubes, no dome, half arch front, no stack, good order.
  - 1 48 in. x 12 ft. Erie Boiler, 52 3-in. tubes, dome 26 in. x 28 in., half arched front, first-class order.
  - 1 42 in. x 12 ft. Horizontal Boiler, 40 3-in. tubes, dome 22 in. x 24 in., half arch front, fine order.
  - 30 in. x 7 ft. Watertown Portable Boiler, 22 3-in. tubes, cast iron dome, nearly new.
  - 1 7 H. P. Vertical Boiler, good as new.
  - 1 4 1/2 x 5 Payne Automatic Vertical Engine, first-class order.
  - 1 6 H. P. Vertical Engine, in strictly first-class order.
  - 1 5 H. P. Troy Vertical Engine and Boiler, nearly new.
  - 1 8 H. P. Erie Vertical Boiler, in fair order.
- All of the above boilers and engines have been thoroughly overhauled and put in first-class running order. For further information write.

**THE W. P. DAVIS MACHINE CO.,**  
 126, 128, 130 Mill St.,  
 ROCHESTER, N. Y.

**BARCAINS.**

One 16 in. x 36 in. Wetherill Corliss Engine, practically new.  
 Large stock of Corliss, Automatic and Plain Slide Valve Engines.  
 Horizontal and Vertical Boilers, all sizes and descriptions.  
 Let us know your needs.  
**LOVEGROVE & CO.,**  
 Philadelphia, Pa.

**ENGINES.****Immediate Delivery.**

- 1 18 1/2 x 18 Ideal.
- 2 18 1/2 x 18 McIntosh & Seymour.
- 1 14 1/2 x 15 " "
- 2 15 x 14 Ideal.
- 1 12 x 20 x 14 Ideal Tandem Compound.
- 2 13 x 12 Ideal.
- 1 8 x 10 Ball.
- 1 6 x 8 Vertical.
- 1 1000 H. P. Austin Open Hot Water Heater.
- 2 7 1/2 x 5 x 6 Worthington Duplex Feed Pumps.

Any of the above can be inspected and delivered at any time.

We have a large stock of Dynamos, Boilers, Pumps and miscellaneous machinery. Write us for details and lowest prices.

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Edwin H. Cheney, Mgr.,

1625-204 Dearborn St., Chicago, Ill.

**FOR SALE.**

42 inch Schellenback Pulley Lathe,  
 Bores and turns simultaneously.

Portions of three shops for sale.

Write us your wants.

**J. B. DOAN & CO.,**

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**For Immediate Delivery.**

Engine Lathes, 10 in. to 32 in. swing.  
 Speed Lathes, 10 in. to 20 in. swing.  
 Shapers, 10 in. to 26 in. stroke.  
 Planers, 20 in. to 34 in.  
 Drill Presses, 10 in. to 28 in.  
 Milling Machines, Hand and Power.  
 Screw Machines and Monitor Lathes up to 20 in.  
 Feed and Power Presses, a variety of sizes.  
 Drop Hammers with and without automatic lifts.  
 Hurlburt & Rogers Cutting-off Machines.  
 Send for catalogue of Presses.

**The Danielson Machine & Tool Co.,**  
 CLEVELAND, O.

**Hoisting Engines.**

- 19 New and second-hand Steam and Electric Hoists, 8 to 125 H.P. electric hoists.
- 32 Horizontal, Vertical and Portable Boilers, new and second-hand, 125 H.P. and smaller.
- 19 Horizontal and Vertical new and second-hand Slide Valve and Automatic Steam Engines.
- 9 New and second-hand Gas Engines.
- 4 Pair Coupled Vertical Engines, 5 in. to 12 in. cylinders.
- 20 New and second-hand Steam Pumps.
- 9 Vertical and Horizontal Centrifugal Pumps, new and second-hand.
- 2 12 ton Steam Road Rollers.
- 1 Small Air Compressor, 150 lbs. test.
- 1 225 lb. Steam Hammer.
- Lot Derricks, Pile Hammers, Balls, Cars, etc.

**CARLIN MACHINERY & SUPPLY CO.,**

Jno. H. Carlin, Prop.,

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**FOR SALE-BARCAINS**

- 50 H. Horizontal Tubular Boiler, guaranteed...\$225
  - Belt Power Elevator and Platform..... 125
  - 300 H. Austin Feed Water Heater..... 120
  - 100 H. Receiving Tank, 150 lbs. test..... 60
  - 16 x 6 "New Haven" Lathe..... 75
  - 36 in. "Stevens" Pulley Lathe..... 75
  - 16 in. "Huyett & Smith" Ventilating Fan..... 40
  - 10 H. Upright Side Crank Engine, new..... 70
  - 15 H. Submerged Flue Upright Boiler..... 70
  - No. 3 "Sturtevant" Blower..... 18
  - No. 1 "Sturtevant" Blower, new..... 12
  - Slate Sensitive Drill and Chuck..... 25
  - 16 in. Upright Drill Press..... 15
  - 20 in. x 20 in. x 4 ft. Iron Planer, not complete..... 80
  - 12 H. Kimble Automatic Upright C. C. Engine..... 80
  - 10 H. "Erie City" Upright Boiler, complete..... 75
  - 15 H. Upright Boiler, complete with fittings..... 80
  - "Diamond" Emery Grinder..... 12
  - 4 ft. x 15 in. Planer Chuck, heavy..... 15
- Send for discounts.

**PARADOX MACHINERY CO.,**

181 E. Division St., Chicago.

**Special Bargains.**  
Second-Hand Tools.**LATHES.**

- 111 x 5 Prentice Bros.
- 111 x 6 Prentice Bros.
- 312 x 6 Spencer, speed.
- 114 x 4 ft. 6 in. Putnam.
- 114 x 5 Putnam.
- 214 x 6 Putnam.
- 116 x 6 Pratt & Whitney.
- 116 x 6 Brown.
- 116 x 6 Harrington.
- 116 x 6 Somerset.
- 117 x 6 Wm. Gleason.
- 118 x 6 Fuller.
- 118 x 6 McMahon.
- 218 x 6 Pratt & W., plain.
- 118 x 7 Pratt & W., plain.
- 118 x 8 Pratt & W.
- 118 x 10 Am. T. & M. Co.
- 118 x 12 Heed.
- 120 x 7 Pratt & W., plain.
- 220 x 8 McMahon.
- 120 x 8 Stover.
- 220 x 8 Bullard.
- 320 x 10 B'g'pt Chucking.
- 121 x 8 Dustin & Hubbard.
- 126 x 12 Lathe & Morse.
- 130 x 17 Pond.
- 132 x 14 Pond.
- 134 x 19 Freedland.
- 150 x 16 Field.
- 1 B'mont Single Axle Lathe

**PLANERS.**

- 124 x 24 x 6 Putnam
- 126 x 26 x 6 N.Y.S. Engr. Co.
- 140 x 40 x 20 Fitchburg.
- 114 ft. 6 in. Sellers Plate Planer.

**DRILLS.**

- 1 3-spindle Ames.
- 12-spindle Garvin.
- 18-spindle W. & Rogers.
- 120 in. Prentice, lever feed
- 125 in. Weeks & Halsey.
- 139 in. New Haven.
- 1 Bement & D. Upright.

**SHAPERS.**

- 19 in. Crank, Bement.
- 215 in. fric., Hendey.
- 112 in. Crank, Prentiss.
- 116 in. fric., Putnam.
- 120 in. fric., Juengst.

If you want to buy or sell let us know.

Send for Special List.

**MANNING, MAXWELL & MOORE,**  
 85-87-89 Liberty St., N. Y. City.  
 Branches at Chicago Pittsburgh and Cleveland.

**FOR SALE—BAR MILL.**

- 12-in. 3-high Bar Mill.
- 9-in. 3-high Bar Mill.
- 12-in. Cold Rolling Mill.
- Corliss Engines coupled direct to trains.
- Tubular and Waste-heat Boilers.
- Heating Furnaces.
- Shears, Saws, Cooling and Straightening Beds, etc.
- 5 acres of ground.
- Building, 237 x 121 ft.
- Brick Building for additions, 360 x 80 ft.
- Connections with four railroads.

Above plant is located in thriving Ohio town.

**W. J. CARLIN COMPANY,**  
 610-611 Lewis Bldg., Pittsburgh, Pa.  
 NEW YORK OFFICE:  
 514-515 Park Row Bldg., New York, N. Y.

**FOR SALE.**

- A complete Set of Blind Making Machinery.
  - 1 Sash and Door Sticker.
  - 1 Sash and Door Tenantor.
  - 1 Door Sander.
  - 1 Sash Mortiser.
  - 1 Sash and Door Squeezer.
  - 1 Two-Spindle Shaper.
  - 1 Moulding Sticker.
  - Several hundred moulding knives.
  - 1 10 H.P. Westinghouse Engine.
  - 1 50 H.P. Stationary Engine and Boiler.
  - 1 40 H.P. Stationary Boiler.
  - 1 80 H.P. " "
  - 1 50 H.P. Portable " "
  - 1 30 H.P. " "
  - 1 6 H.P. " "
  - 1 25 H.P. Motor; 1 2 1/2 H.P. Motor; 1 1 1/4 H.P. Motor
  - 1 Blacksmith Bolt Header with new set of dies.
  - 1 D.K. Dederick Perpetual Baling Press, as good as new.
  - 3 Enslage Cutters.
- Write for prices. All of above will be sold cheap for cash.

**F. R. PATCH MFG. CO.,** Rutland, Vt.

**ENGINES AND SCREW MACHINE.**

- No. 3 Bardons & Oliver Screw Machine, good as new, \$600.00. Has all cats. attachments and forming tool slide.
- 16 1/2 x 32 Allis Corliss, box bed type; right hand, 10 years old, used very little and overhauled, \$800.00.
- 28 in. Paper Cutter. Gauge Lathe. 2 1/2 H.P. Motors, etc.

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121 W. Water St., Milwaukee, Wis.

**To Iron and Steel Manufacturers.**

A first-class Holland firm wishes to represent an American house for the sale of iron and steel bars, plates, etc., etc. Address  
 "J. C. L." care The Iron Age, New York.

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Are offered by J. H. Hillman & Son, Empire Building, Pittsburg, Pa., in the following first-class properties:

### BLAST FURNACES IN PENNSYLVANIA.

No. 1, capacity 300 tons daily, now running, making over \$5 per ton profit. Can be turned over promptly. Will pay half the cost this year.  
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### LAKE SUPERIOR (Mesabi) IRON ORE Lands.

Ready for operation August 1st.

### TWO HUNDRED COKE OVENS AND Five Thousand Acres of Coal Lands in West Virginia.

### FIFTY COKE OVENS AND COAL Lands on the Main Line of Pennsylvania Railroad.

### CONNELLSVILLE COAL LANDS and Coke Ovens.

### EIGHTY COKE OVENS AND CONNELLSVILLE coal in Connellsville region.

### FIFTY THOUSAND ACRES OF COALING coal adjoining Connellsville region. Nine foot vein in Fayette and Greene Counties, Pa. These lands offer the best investments now before the American public.

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Capacity 25,000 tons per annum. Now shipping East and West. Modern electric equipment. Coal is like Pocahontas smokeless used in the United States Navy. Being exported.

### FIFTY THOUSAND ACRES OF KENTUCKY Coal and Timber Land. At a low price.

### WELL-KNOWN IRON PROPERTY IN Kentucky

With well-developed ore mines and millions of tons of ore in sight and has also a large number of farms on the Cumberland and Tennessee Rivers. This property contains 40,000 acres and is a principality in itself.

### MANUFACTURING PROPERTY IN the Monongahela Valley.

### THICK VEIN COAL IN THE MONONGAHELA Valley.

In the 3d, 4th, 5th, 6th and 7th pools of the Monongahela River.

### SOMERSET COUNTY COAL LANDS.

In tracts of five, ten, twelve and seventeen thousand acres each, are cheap and are being sold rapidly to Eastern capitalists.

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On the Allegheny Valley Railroad is splendid property capable of prompt development.

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### A MODERN ROLLING MILL.

### MANUFACTURING PROPERTIES and sites in Pittsburg and Allegheny Cities, Pa.

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### A FIRST-CLASS CHARCOAL BLAST Furnace.

For full information address

**J. H. HILLMAN & SON,**

Empire Building,

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## FOR SALE.

Pair 14 x 36 Harris-Corliss; 24 x 56 Watts-Campbell; 18 x 12 and 21 x 12 New York Safety. 100 K. W. M. P. 3 500, 500, 300, 50 50-light dynamos. 2 20 H.P. crane motors, speed 500. 1 H.P. 220 volt motor, slow speed. 4 Sturtevant exhausters. 3 Buffalo blowers. Steam shovels, hoisting engines, crushers, coal mining machinery and contractors' equipment. **SEND DESCRIPTION** any machinery wanted or for sale.

CHESLEY MACHINERY CO., Havemeyer Bldg., New York.

## CUPOLAS, CRANES, LADLES, BLOWERS,

and all other Foundry Equipment, new and second-hand. Send us list of your wants.

**The J. D. Smith Foundry Supply Company,**  
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# AUTOMATICS.

Five 2½ in. Cleveland Automatic Screw Machines, used less than twelve months. In first-class condition.

## GEAR CUTTER.

50 in. Gould & Eberhardt Full Automatic, cuts spurs, bevels and worms, complete with pump, pan and usual features.

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No. 3 Cincinnati Universal, Automatic feeds in all directions.

42 in. Bullard Turret Boring Mill, Screw Cutting.

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## PARTIAL LIST OF SECOND-HAND MACHINERY IN STOCK.

1 80 H.P. 60 in. x 16 ft. Tubular Boiler.  
2 125 H.P. 66 x 18 Tubular Boilers.  
1 100 H.P. Locomotive Boiler.  
1 100 H.P. Baker Automatic 14 x 20.  
1 100 H.P. Atlas Automatic Engine.  
1 150 Buckeye Automatic Engine, size 16 x 18.  
1 125 Buckeye Automatic Engine, size 14 x 16.  
1 100 H.P. Ball Automatic Engine, size 13 x 12.  
1 No. 12 Morris Centrifugal Sand Pump, direct connected to 12 in. vertical engine.  
2 No. 6 Morris Centrifugal Sand Pumps.  
1 16 x 10 ½ x 10 Worthington Duplex Pump.  
1 12 x 12 x 10 Worthington Duplex Pump.  
1 7 x 4 ½ x 10 Worthington Duplex Pump.  
1 Deane Puxley Power Pump, 5 in. plungers.

**RAINIER & WILLIAMS,**  
64 So. Canal Street, Chicago, Ill.

## FOR SALE.

One 50 H.P. Tubular Boiler, 1 10 H.P. Tubular, 1 10 H.P. Upright, 15 H.P.  
One 10 H.P. Locomotive Boiler.  
One 15 x 30 Hor. Engine 10 ft. x 16 in. Bal. Wheel.  
One 11 x 20 " " 7 ft. x 14 in. " "  
One 9 x 16 " " 6 ft. x 12 in. " "  
One 10 ½ x 12 Centre Crank Armington & Sims Wheel Governor, two 5 ft. x 10 in. Bal. wheels.  
One 6 x 10 Centre Crank Engine.  
Write for prices.

**HANNAN & FINTON,** Springfield, Mass.

## FOR SALE.

3 Steam Fire Engines, very cheap.

**WALSH'S SONS & CO.,** Newark, N. J.

## FOUNDRYMEN.

We have for sale a complete Foundry for making Stoves. Will sell whole or part.

**The Thomas & Lowe Machinery Co.,**  
Providence, R. I.

## FOR SALE.

18 x 42 Corliss Engine in A1 condition, also 80 H.P. New Era Gas Engine in excellent condition, which has been running only six months. Both ready for delivery about Oct. 1st. Can be seen during working hours. Apply

**THE IRELAND & MATTHEWS MFG. CO.,**  
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## WANTED.

One large Tumbling Barrel for cleaning castings, about 4 ft. in diam. and about 8 ft. long. Address with description and lowest price.

**PENNSYLVANIA ENGINEERING WKS.,** New Castle, Pa.

# Here We Are.

**McDowell, Stocker & Co.,**

**59-61 So. Canal St., CHICAGO.**

On hand for immediate delivery, large and well assorted stock of both new and second-hand machinery. New list just issued. Ask for one. Send US your inquiry, you will profit by it.

**McDowell, Stocker & Co.,**

**59-61 So. Canal St., CHICAGO.**



## For Quick Delivery.

### Single Punches and Shears,

48 in. throat, 1½ in. in ½ in.

36 in. throat, 1½ in. in 1 in.

### Splitting Shears,

For ½ in. and ¾ in. plate.

### Double Angle Shear for 4 x 4 x ½ in. angles.

Plate edge Beveling Shear for ½ in. plate.

Gate Shear and Multiple Punch, 78 in.

### Bending Rolls, 12 ft. 2 in. between housings.

100 in. bet. bags. for 1½ in. plate.

Spacing Table, hand, 8 ft.

Radial Drills, 48 in. and 60 in. arm.

Boiler Makers' Flanging Clamps, 10 ft.

Steam Riveter, 6½ ft. gap.

Duplex Vertical Engines, 9 x 9.

Plate Planer, 6 ft. cut.

HILLES & JONES COMPANY,  
Wilmington, Delaware.

## Engine Bargains.

1 30 in. x 60 in. R. H. Hamilton Corliss, 15 in. shaft; 18 ft. fly wheel in 8 sections; rim 12 in. x 15½ in.

1 18 in. x 32 in. Single Cylinder Link Motion Double Drum with friction and brake band Haulage Engine, made by Webster, Camp & Lane.

The above engines are in A No. 1 condition.  
For Sale by

WM. C. JOHNSON & SONS MACH'Y CO.,  
St. Louis, Mo.

## CORLISS ENGINES.

1 26 x 48 Allis Corliss.

1 14 x 36 Cooper Corliss.

1 14 x 30 Frick Corliss.

### LOCOMOTIVE.

1 Standard gauge, 4 driver, saddle tank shifting engine, weight 60,000 lbs., fine shape, cylinders 14 x 22.

One 1-2 Yard Steam Shovel.

One McFlyler Derrick for Hoisting Coal.

GEO. H. BOWLER,  
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1110 Park Bldg., Pittsburgh, Pa.

## FOR SALE.

### ENGINES, SLIDE VALVE.

1 Pair Twin 12 x 18 McCune.

### ENGINES, AUTOMATIC.

1 12 x 20 Atlas.

1 16 x 24 "

4 11 x 11 Westinghouse.

1 16 x 24 Warren.

### BOILERS.

1 72 x 16, 3½ in. flues.

1 72 x 14, 4 in. flues.

1 60 H.P. Upright.

2 12 in. Shafts, 24 ft. long, with couplings.

1 13 in. Shaft, 24 ft. long, with couplings.

Tubing, Rods and Oil Well Casing.

Second-hand Flues, all sizes, cleaned and cut to length.

100,000 ft. Standard Pipe, all sizes.

1 500 light Electric Machine.

McDOWELL & CO.,  
347 Fifth Ave., Pittsburgh, Pa.

## POWER PLANT.

We offer the following complete power plant at a bargain:

1 14 in. x 16 in. ENGINE.

1 54 in. x 14 ft. BOILER, with stack and fittings

1 No. 3 DEAN STEAM PUMP.

Entire plant is in first-class condition and nearly new. Can be seen running in Indiana. Write for price.

WM. A. READE & CO.,  
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## Second-hand Tools

### For Immediate Delivery.

1 800 lb. Merrill Drop Hammer.

1 14 in. x 60 in. Pratt & Whitney Shaping Machine.

1 12 in. x 60 in. Bement Shaping Machine.

1 10 Pratt & Whitney Tool Room Lathe.

1 No. 3 Stiles Panching Press.

1 No. 3 Fowler Press.

1 54 in. x 19 ft. Planer, double head.

1 60 in. Heavy Radial Drill, 4 spindle.

1 Small Horizontal Boring and Drilling Machine, Bement.

1 No. 18 Brown & Sharpe Milling Mach.

1 No. 1½ Pratt & Whitney Hand Milling Machine.

1 No. 2½ Newton Duplex Milling Mach.

2 No. 5 Cleveland Auto. Screw Machines.

1 Lodge & Davis Screw Machine, 2 in.

1 No. 2 Jones & Lamson Screw Machine.

2 36 in. Hydraulic Wheel Presses.

1 16 in. Slotting Machine

## U. Baird Machinery Co.

123-125 Water St., 124-126 First Ave.,  
PITTSBURGH, PA.

### FOR SALE.

One 150 H.P. Cross-compound Armstrong & Sims Auto. Engine, cylinders 11½ and 18½ x 15.  
One 13 in. x 12 in. Phoenix Auto. Engine.  
One 12 in. x 24 in. Wetherill Corliss Engine.  
One 12 in. x 36 in. Babcock and Wilcox Engine.  
One 8 in. x 10 in. Atlas Auto Engine, center crank.  
One 12 in. x 7 in. x 10 in. Worthington Duplex Pump.

One 1000 lb. Ferris and Miles Steam Hammer.  
Also a number of smaller Engines and Pumps.  
THE E. H. WACHS CO., 158 Indiana St., Chicago.

## HAMMER FOR SALE.

One Cleveland Helve Hammer; weight of head and die 2,500 pounds, total weight about 50,000 pounds; 26 inch steam cylinder. In good order. Suitable for slabs, axles, etc., for railroad or general work.

COOKE LOCOMOTIVE & MACHINE  
COMPANY,  
Paterson, N. J.

## FOR SALE.

For immediate delivery, a 10-ton Hand Power Crane in first-class condition, made of 9 in. channel iron; length of jib 30 ft. 6 in.; wrought iron mast, 14 in. diam. at base, 14 ft. 6 in. in height under jib; cast iron base plate, 6 ft. square. Inquire

VULCAN FOUNDRY & MACHINE CO.,  
New Castle, Pa.

### FOR SALE.

Two reels of 1¼ in. second-hand Steel Wire Rope in good condition, weighing 2½ pounds per ft., containing approximately 35,000 ft. This cable was formerly used in street cable road, and no reasonable offer on the same will be refused. Correspondence solicited.

"F. O. F." care The Iron Age, New York.

## Second-hand Machinery For Sale.

Engines, Boilers, Pumps, Heaters, Iron and Wood Working Machinery, all makes, all kinds. Shafting, Pulley Hangers, Boxes, etc. Mining, Cupola and Forge Blowers. We make a specialty of Saw and Planing Mill Machinery.

HARRIS MACHINERY CO.,  
1045 Washington Ave., S. E., Minneapolis, Minn.

### FOR SALE.

Tools lately in use in Boiler Manuf'g Plant.

1 40-ton 36 in. Gap Hydraulic Riveter.  
1 set 20 ft. Niles Rolls.  
1 13 in. x 22 in. x 13 in. Westinghouse Engine.  
1 18 in. x 5½ in. x 18 in. Barr Pump for 500 lbs. pressure.

For additional information, address  
ESTATE OF WM. G. WARDEN,  
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## Machinery Bargains.

24 x 48 Hamilton Corliss Engine.  
24 x 24 ft. Shafting Lathe.  
14 x 30 Cummer 4-valve Automatic Engine.  
14 x 14 Sutton Marine Engine.  
Two 12 x 11 and one 9 x 9 Westinghouse Engine.  
11 x 11 Ide Vertical Engine.  
8 x 16 Rice Automatic Engine.  
600 H.P. Rowe Feed Water Heater.  
200 H.P. Berryman Heater.  
200 H.P. Reynolds Heater.  
200 H.P. Stillwell-Bierce Heater.  
70 H.P. Otis Steel Fire Box Boilers.  
75 feet Double Leather Belt, 22 in.

15 H. P. Gasoline Engine.  
90 H. P. Waste Heat, Vertical Boiler.

The above are all in first-class condition and ready for shipment.

A. L. DAWSON & CO.,  
27-31 W. Washington St., Chicago, Ill.

## FOUNDRY PLANT

for sale or rent. Large capacity; fully equipped and now in operation. Railroad facilities excellent; two belt and one trunk line. Outside Chicago.

Address "FOUNDRY PLANT,"  
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## WANTED.

Estimates for the manufacture of a novelty in cast iron or similar metal. For particulars address in writing.

ECONOMIC COAL IGNITER  
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## FOUNDRY WANTED.

With or without cupola and blower; floor space for actual molding not less than 20,000 square feet; location preferred close proximity to New York City. Address

"IRON FOUNDRY,"  
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## Wanted to Make

We have a complete modern manufacturing plant near Boston, equipped with Power Presses, Automatic Screw Machines, Nickel Plating and Polishing Plant and want to correspond with parties having articles that can be made in such a factory. Address

"W.,"

care The Iron Age, 70 Kilby Street, Boston, Mass.

## Machinery Bargains.

### PLANERS.

34 x 34 x 15 ft. bed, made by Fairbanks, Providence, R. I. Price, \$500.00.

### LATHES.

Two 16 in. swing, 6 ft. bed, made by Putnam. Price, \$125.00.

One 15 in. swing, 6 ft. bed, made by Wood & Light. Price, \$125.00.

Two 18 in. swing, 8 ft. bed, made by Campbell & Gage, Waterford, N. Y. Price, \$125.00.

One 17 in. swing, 8 ft. bed, made by Campbell & Gage, Waterford, N. Y. Price, \$125.00.

One double head lathe, 32 in. swing, 30 ft. bed, made by Campbell & Gage, Waterford, N. Y. Price, \$500.00.

F. O. B. cars, Philadelphia, Pa.

A. V. KAISER & CO.,  
222 South Third St., Philadelphia.

### FOR SALE AND PROMPT DELIVERY.

35 lbs. Steel T Rails, El Paso, Tex., delivery.  
45 to 48 lbs. Steel T Rails, Washington, D. C., delivery.

56 lbs. Steel T Rails for delivery between Buffalo and Chicago on line of Nickel Plate R. R.

60 lbs. Steel T Rails, Chicago and Kansas City delivery.

62 lbs. Grooved Girder Johnson Steel Rails, Washington, D. C., delivery.

83 lbs. Grooved Pennsylvania Steel Girder Rails with bolts, nuts and chairs for Chicago delivery.

350 tons of new 25 to 45 lbs. Steel T Rails, Chicago delivery.

Material subject to inspection at points of shipment.

BLOCK-POLLAK IRON CO.  
No. 923 Marquette Bldg., Chicago, Ill.



**FOR SALE.****SPECIAL ENGINES.**

- 1 14 in. x 20 in. (Vertical) Slide Valve.
- \* 14 in. x 30 in. Keystone Corliss (Brand new).
- \* 11 in. and 9 in. x 24 in. Tandem Comp'd "Buckeye" (latest type) with condenser.
- \* 22 in. x 42 in. Wetherill Corliss.
- \* 23 in. x 48 in. Geo. H. Corliss make.
- 1 24 in. x 36 in. Mackintosh, Hemphill & Co.
- 1 36 in. x 60 in. Tange Bed type.
- 1 Crane Elevator Co. Modern Elevator Engine.

**BOILER.**

- 1 Horizontal Tubular, 72 in. x 16 ft., with 84 3/4 in. tubes, approved for 100 lb. pressure, complete.

**SHAFTS AND PILLOW BLOCKS.**

- 15 Very fine forged Shafts, finished all over, 10 in. diam. to 16 in.

**FLY WHEELS.** For Balance and for Belts.**SMOKE STACK.**

- Very fine steel self-supporting stack, 64 in. diam., 100 ft. high, with base casting, ornamental top and ladder.

**HAMMERS.**

- 1 Hackney Cushion Hammer.
- 1 1200 lb. Double Frame Steam Hammer.
- 14 ton do.

**SHEARS.**

- 1 New Alligator Shear with capacity up to 2 1/2 in. Cold Billets, or for Scrap cutting. Knives 14 in. long.

**LOCOMOTIVES, New and Second-Hand.**

- \*Signifies Right-hand.
- \*Signifies Left-hand.

**B. M. EVERSON.**

German Nat. Bank Bldg. (6th and Wood),  
PITTSBURG, PA.

Sales Agent for  
Baldwin Locomotive Works, Phila.

**Bargains in Locomotives.**

Ten 16 x 24 Standard Gauge Locomotives, weight 33 and 35 tons; also one 20 ton Standard Gauge Locomotive, all with tenders; one 30 in. Gauge Locomotive and one Standard Gauge Saddle Tank Locomotive, weight about 9 tons. One 15 ton Buffalo Pitts Road Roller and one No. 3 Gates Crusher mounted on wheels.

GRANT & WILLIAMS,  
323-324 Park Row Bldg., New York, N. Y.

**For Sale Cheap.**

- 7 Contractors' Plows, No. 99 "Syracuse."
- 6 Contractors' Plows, No. 1 "Syracuse."
- 1 Portable Saw Mill, complete.
- 1 6 in. Centrifugal Pump.
- 3 Gleason & Bailey Pumps, No. 2.
- 3 Derrick Hoists.
- 5 No. 1 Jenne Jacks.
- 50 Two Wheel Road Scrapers, Western Wheel Scraper Co.
- 6 Narrow Gauge Dump Cars, 36 in.

SMITH & CAFFREY,  
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**HARDWARE STORE FOR SALE.**

\$2,700, stock and fixtures, all modern. The stock consists of hardware, tools, guns, stoves and ranges; business well established and growing; good store and fine location. Satisfactory reasons for selling. Address

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**Factory Site at Niagara Falls.**

Four lots for sale situated upon the Erie Railroad, with a spur track from same. For particulars with ground plan and photograph of the building, apply to

F. W. OLIVER CO.,  
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**FOR SALE.**

Hardware stock in a New England city of 60,000 inhabitants. First class location and an up-to-date store and stock (incorporated). Inventory \$10,000.00 to \$12,000.00. Address

BELCHER & LOOMIS HARDWARE CO.,  
Providence, R. I.

**FOR SALE.**

One Pond Planer, 36 x 36 x 17 ft.

One New Haven Lathe, 25 in. swing, 16 ft. bed.

One vertical Engine 14 x 14, roughtry valve, self contain.

One Sturtevant Steel Blower, 68 in. high, 26 inlet, 22 outlet.

Also one Atlas 10 x 12 Engine.

Also a large lot of iron tanks.

WM. ECKBOLDS' SONS,  
711 E. Girard Ave., Philadelphia.

**FOR SALE.**

One Corliss Engine, 26 in. x 60 in., fly wheel 20 ft. diameter, section of rim 15 1/2 in. x 11 in. One Multiple Drill Press, four spindles, 8 ft. between housings, built by Messrs. Bement, Miles & Co., for drilling holes in plates.

Five trains of plate rolls. One 9 ft. Fly wheel, new, 7 in. bore, weight 6000 lbs. Two Bliss Guillotine Upright Shears, 72 in. gap, 3 in. stroke. One Deane Duplex Pump, 6 x 5 1/2 x 6. One Rod Straightening Machine, built by the Medart Patent Pulley Co. for straightening rods up to 3 in. diameter and 25 ft. long. A lot of extra cold and hot plate rolls (new) and numerous other items from the Olney Copper Plant.

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Gaul and Sargeant Sts., Philadelphia.

**MACHINERY.****SECOND-HAND, FIRST-CLASS ORDER**

- 3-16 in. Adt. Rotary Wire Straightener, five dies, with loose pulley on stand.
- 25 lb. Justice Power Hammer
- 50 lb. Power Hammer (Duclet & Eisenhardt).
- 25 lb. Bradley Helve Hammer.
- 40 lb. Bradley Helve Hammer.
- 500 lb. Merrell Board Lift Auto. Drop Hammer.
- 1500 lb. Morgan & Williams Double Standard Steam Hammer.
- 800 lb. Pratt & Whitney Board Lift Automatic Drop Hammer.
- No. 7 Jarecki Pipe Machine.
- 2 1/2 in to 12 in. Curtis & Curtis Pipe Machine.
- 3-16 in. Adt style "D" Riveting Machine.
- Garvin Single Spindle Profiler.
- No. 1 Warner & Swaney Screw Machine with wire feed.
- No. 3 Pratt & Whitney Screw Machine with wire feed.
- No. 1 Bliss Foot Press.
- Brown & Sharpe Polishing and Finishing Lathe.
- No. 2 Plain Milling Machine (Reed).
- No. 3 Hand Milling Machine (Garvin).
- No. 8 Milling Machine (Brainard).
- No. 4 Milling Machine (Brainard).
- No. 2 Diamond Wet Tool Grinder.
- No. 5 Niagara Slitting Shear.
- 18 in. throat Power Punch.
- 5 1/2 in. throat Power Shear.
- 24 in. throat Power Shear.
- 14 ft. Boiler Plate Planer.
- No. 86 Niagara Bench Screw Press.
- 6 in. Boynton & Plummer Shaper.
- 15 in. Hendy Shaper.
- 18 in. Juengst Shaper.
- 15 in. Garvin Spinning Lathe.
- 10 in. and 13 in. Sensitive Drills.
- 20 in. Barnes Drills.
- Plating Dynamos from 300 to 700 gallons capacity.
- Plating Tanks.
- 14 in., 16 in., and 21 in. Engine Lathes.

**NEW.**

Engine Lathes 12 in. to 38 in. Swing, various lengths of bed.

10 in. to 40 in. Drill Presses, standard makes.

Nos. 1, 2 and 3 Cincinnati Full Univ. Mill'g Mchs.

No. 2 Cincinnati and No. 2 Hisey Plain Mill'g Mchs.

36 x 36 x 12 ft. Gray Planer with two heads.

Write us for any machinery wanted, or what you may wish to exchange or sell.

O. C. WORMER MACHINERY CO.,  
Ft. of Shelby Street, Detroit, Mich.

1-20 in. x 48 in. Corliss Horizontal Engine. 1-11 in. x 24 in. Slide Valve Engine. 1-8 in. x 10 in. Erie Engine. 3-125 Horse Horizontal Tube Boilers. 1-150 Horse Horizontal Tube Boiler. 1-135 Horse Upright Corliss Boiler. 3-20 Horse Upright Boilers. 1-300 Horse Berryman Feed Water Heater. 1-Hydraulic Riveting Machine 86 in. gap. 1-Boiler Plate Planer, 16 ft. long, very heavy. 1-Power Shears. 1-Double Arbor Milling Machine. 1-18 in. Swing Lathe, short bed. 1-Horizontal Boring Machine. 3-New Woodward Steam Pumps. Several small lathes, screw cutting. 2-Double Belts, one 104 ft., one 86 ft. x 18 in. Hoyt's make. Large stock of belting, various sizes. ROBT. J. GRAY, 52-54 East 132d St., New York.

**FOR SALE.**

**One Hundred Open Top Square Iron Tanks.** Mounted on wheels. Capacity of each, 22 cubic feet, or 166 gallons. For blue prints and prices send to

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**FOR SALE, SECOND HAND TOOLS.**

Three "Bryant" Cold Saws.

One "Whitcomb" Planer, 37 in. x 36 in. x 9 ft.

One "Cockburn" Concrete Mixer.

One "Sturtevant" Blower, No. 8.

One do. do. No. 5.

Two Horizontal Tubular Boilers, 66 in. x 16 ft. with 90 three-inch tubes, now running under 80 lbs. pressure.

**ALSO**

**NEW CORNELL BLOWERS**—Poole's patent, all sizes—the best in the market—send for prices.

J. B. & J. M. CORNELL,  
26th St. and 11th Ave., New York City.

**Where to Locate.**

Manufacturers using iron, steel or wood will find the best locations for successful plants along the

**SOUTHERN RAILWAY.**

These locations lead in cheap raw material, cheap, contented and desirable labor, cheap fuel and in good facilities for marketing products. Opportunities now open for establishing new plants are fine and should be investigated. Other investments will prove profitable in the South.

M. V. RICHARDS,

Land and Industrial Agent, Southern Railway,  
WASHINGTON, D. C.

**BLOWERS FOR SALE.**

No. 5 Root Blower, Engine and Bedplate.  
No. 6 " " " " " "

All in good order, will be sold at a bargain. Will sell separate if desired.

A ASHER,

109 Liberty St., 2d Floor, New York.

**TWO IRON BRIDGES.**

Each of two spans 124 feet, with a draw span of 350 feet and 260 feet; these are railroad bridges, comparatively new; were taken out because too light for new heavy rolling stock. Will make splendid wagon bridges; will sell all together or separate spans; terms to suit.

JEFFERSON IRON CO.,

First Ave. and 27th St., P. O. Box 597,  
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**FOR SALE.**

Atlas-Corliss Engine, 18 x 48, in running order. Delivery at once. Price low.

THE CRANE & BREED MFG. CO.,

Cincinnati, Ohio.

**FOR SALE.**

The English patent on new and most important Tool Machinery. For particulars, address

"S. A., 2526,"

care Rudolf Mosse, Stuttgart, Germany.

**CAR COUPLERS.**

Advertisers have large experience as makers of Malleable Castings, have a well equipped plant and wish to make arrangements with the owner of an accepted coupler to make it for them or to market it outright. References exchanged.

Address "COUPLER,"

Care The Iron Age, New York.

**WANTED.**

Second-hand Locomotive; weight, 10 or 12 tons, 3-foot gauge; height not to exceed 5 feet.

WEBSTER COAL & COKE CO.,  
Real Estate Trust Building, Philadelphia.

**FOR IMMEDIATE DELIVERY.**  
**Angles, Beams,**  
**Channels, Plates,**  
**Tees, Zees, Bars.**

5000 tons in stock. Moderate prices. Send for stock sheet and quotations.

**STRUCTURAL DEPARTMENT,**  
**ILLINOIS STEEL CO.,**

Designers, Manufacturers and Erectors of  
 Structural Iron Work, Dealers in Structural Materials.

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The Minister for the Colonies does not bind himself to accept the lowest or any tender.

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Second-hand engine, eight hundred H.P., running seventy-five to eighty revolutions. Our steam pressure one hundred pounds. Wrought iron shaft, twelve inch diameter, 12 to 14 feet long, fly wheel 20 feet. Slide valve preferred. Must be in good repair.

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- No. A 126 1 32x11 locomotive fire box
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- No. A 32 8x24 stationary
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- No. A 183 1 lathe, 6-ft. bed, 18-in. swing
- No. A 184 1 lathe, 6-ft. bed, 20-in. swing
- No. A 185 1 Putnam lathe, 12-ft. bed, 24-in. swing
- No. A 186 1 lathe, 6-ft. bed, 16-in. swing
- No. A 187 1 Wheeler lathe, 6-ft. bed, 14-in. swing
- No. A 188 1 metal lathe, 3-ft. bed, 8-in. swing
- No. A 189 1 lathe, 6-ft. bed, 16-in. swing
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- No. AH 163 1 upright mortising machine, Hewitt & Smith, 6-in. stroke
- No. AH 164 1 upright mortising machine, H. D. Smith, 6-in. stroke
- No. AH 166 1 horizontal boring machine, 20-in. spindle
- No. AH 171 1 horizontal boring machine, tandem cutter, 24-in. spindle
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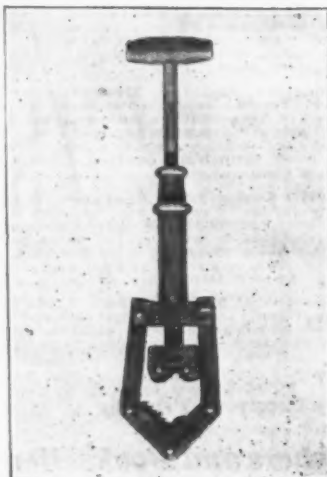
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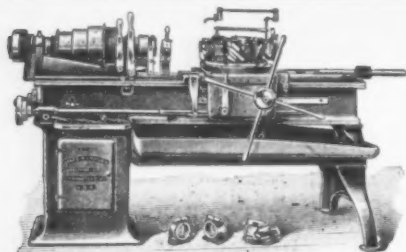
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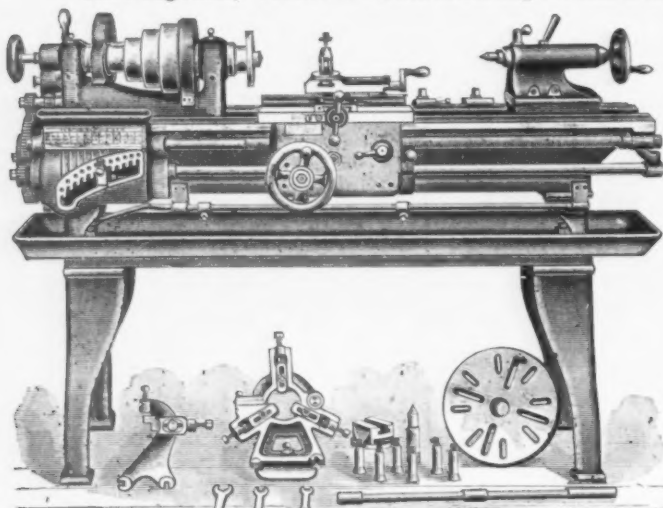
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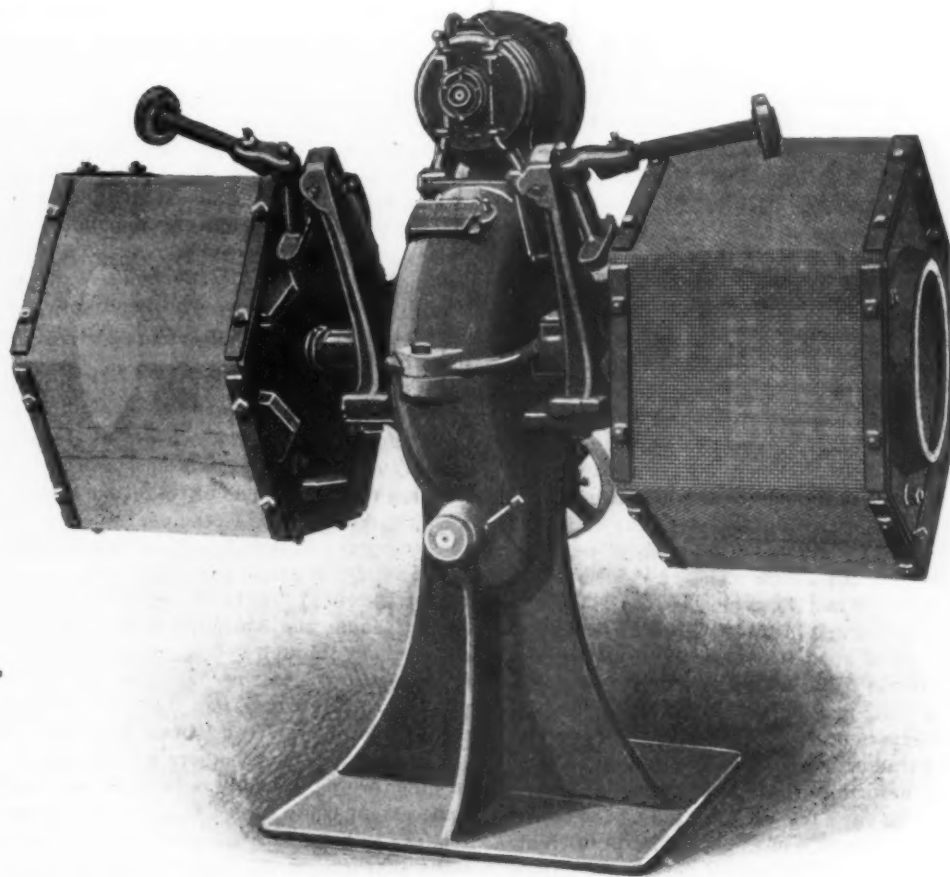
## **The Eberhardt Sand Mixer and Sifter.**

A new method of arranging the motor operating the sand mixer and sifter built by Gould & Eberhardt, Newark, N. J., is shown in the accompanying engraving. The motor is placed on top of the machine and is belted from a suitably sized pulley on the armature shaft direct to the worm shaft, which extends through the center of the column and engages the worm gear placed at the center of the shaft carrying the sieves. The sieves are of different meshes, one fine and one coarse. In a recent issue of *The Iron Age* we illustrated one of these machines in use in the foundry of the General Electric Company, at Schenectady, which was mounted

a large foundry to the other, its convenience cannot be disputed. There is no question but what it is cheaper to take the machine to the work than it is to carry the sand to the machine and back again.

These machines are also made belt driven, for use in small foundries.

The first half of 1900 broke all records in the amount of new and proposed textile mill construction in this country. According to the *American Wool and Cotton Reporter*, the number of mills started during the six months was 307, a gain of nearly 70 per cent. over the 183 reported for the last half of last year, and an increase of eight new mills over the 299 reported for the whole year



THE EBERHARDT SAND MIXER AND SIFTER.

on a portable truck, and pulled up and down the foundry, sifting sand in various parts of the floor, the current for operating the electric motor being derived from a flexible cord connection which is attached to plugs conveniently located in various parts of the works. The manufacturers of these machines have an order from the Westinghouse Electric Mfg. Company, at Pittsburgh, for one of their motor driven mixers and sifters, which, instead of being hauled from one part of the shop to the other on a truck, will be carried from place to place by the traveling crane, a suitable eye bolt being placed in the top of the machine for the crane hook. The use of these automatic sifters in foundries furnishes an ideal method of procuring a supply of well mixed sand, and as the machine can be easily transferred from one part of

of 1899. Of the 307 mills 194 are devoted to the manufacture of cotton, 29 to wool, 45 to knit goods, hosiery, &c., and 39 to miscellaneous purposes, including silk and linen manufacturing, bleaching and finishing. In mill construction for the six months the South leads with a gain of 97 over the last half of 1899, while the North has an increase of 27.

At Pittsburgh, suit has been entered by the Toledo Bridge Company to recover \$10,026.76 from the American Engineering & Construction Company. The plaintiff avers that the defendant contracted to build for the former a four-track drawbridge over a drainage canal at La Moyne, Ill., for a certain price, and then abandoned the contract after some work had been done.



## Glimpses of the British Iron Industry.—I.

EDITORIAL CORRESPONDENCE.

A hurried visit to some of the British iron centers can naturally not be productive of more than very vague impressions, even though a certain amount of preparation for such a visit comes from many years' study of the literature bearing upon the resources and the methods of their utilization. Observation, fleeting though it be, corrects or modifies opinions formed at a distance, and interviews with men at the helm of affairs bring out the special circumstances which determine the lines of work, particularly when the leaders nearly all have themselves studied American methods.

Naturally one is in the attitude of comparing constantly with resources and methods at home, with the inevitable tendency to view with suspicion as to its merit anything which diverges from known standards and practice. We have had our superiority dinned into our ears by our own travelers abroad and by returning European visitors until there is danger that our judgment be warped. There is almost a mania for everything that is American, particularly in England, so that we may before long underrate, to our cost, what is being done in Europe. To some extent the older industrial nations are struggling with problems which ultimately we must learn to deal with. Thus on the Continent costly fuel has placed them in advance of us in the development of steam economy in rolling mill engines. In Great Britain trade unionism has entered into phases which ultimately we may be forced to meet ourselves. In some trades, in isolated localities, the attitude of labor with us is very similar to that which it has assumed quite generally in Great Britain.

While it is true that there are radical differences of character which must be studied and taken account of, still, after all, human nature is very much alike the world over.

What is probably the most striking feature of the attitude of the English iron industry to-day is its pessimism and its lack of courage. We have been inclined to regard the writings of Englishmen, during recent years, who extolled American methods to the disadvantage of those of their own country as intended chiefly to arouse their countrymen from lethargy. We have regarded them as exaggerated, for effect. They are inspired by a noble and a patriotic motive, which is coupled with a gratifying sense of courage in the face of danger to personal interests. It is an added temptation to do good by telling unpalatable truths when it implies the possession not alone of clear insight but also of unselfish courage. Reuleaux's experience in Germany has proven that services of that character are sometimes severely punished.

An American naturally views the subject from another point. Chiding one's friends by extolling the merits of one's rivals in the presence of the latter is apt to create an undue sense of superiority in the model. We know of instances of leading American ironmasters who frankly announce that there is nothing to learn in Europe and who act upon that conviction by declining to waste time in visiting European works and in meeting their captains of industry. No graver mistake could be made.

We believe that what might be called the American scare has already done the European industry much good, not alone from a technical, but also from an economic point of view. In a discriminating manner a number of American improvements have been adopted. One hardly visits a plant in which there are not evidences of this influence. But from the broader, and it may be confessed the more important point of view, of management, some American notions first repelled are receiving the compliment of imitation. We observe an attitude of apology for what is old, or rather a franker recognition of what is antiquated. There is a more eager striving for the best, and less satisfaction with what is good enough, than there was ten years since.

A study of the British iron industry from the standpoint of a rival and competitor should begin with a survey of the resources upon which it is based. If it is handicapped there beyond a certain point it must inevitably fall behind in the race. If it possesses inherent strength, then it needs only money and the desire to employ it to create adequate plant, and brains and labor to keep it at work. No one doubts that Great Britain possesses accumulated capital enough to provide modern works, nor that she disposes of the skilled labor. Finally comes the question of markets.

In itself a close study of so extended and varied a subject would involve years of labor and require exceptional opportunities, and then only might conclusions be ventured as to the bearing and chances of improved equipment and of what might be termed reform in methods. But at this particular time the difficulties are enhanced because conditions are abnormal, so that doubts arise as to what new modifications some factors may assume when normal times return. It is only necessary to refer to the question of the coal supply in the future to realize at once that wide differences of opinion may exist.

It is hardly necessary to marshal an array of figures to show that Great Britain has lost ground relatively during recent years. That has been done *ad nauseam*. A favorite theme has been to attribute this stagnation to undue conservatism in technical matters, which, if true, could be most easily mended. Others have ascribed it to the attitude of labor. Some, and among them are many of the leading men in the industry themselves, believe that the maximum justified by the mineral resources has been reached. Others hold that for some years Great Britain has lacked great captains of industry, men of courage and ability, commanding the confidence of capital, men who could break with traditions, overcome prejudice and be the pioneers in a fresh start. Finally, there are those who believe that the principal cause for the present situation lies in the shutting off of markets by tariff barriers. Following the example of the United States, one by one of the Continental countries has aimed to develop its own resources and supply its own wants. Great Britain has thus lost outlet territory steadily and in recent years has been forced to face the growing rivalry of some of its former customers, notably the United States and Germany, in neutral markets. And this competition, it is urged, is aggravated by methods which render it even more dangerous to the British iron maker. Secured by tariff legislation against interference at home, the American and German producers, to some extent through syndicates and consolidations, hold up values in their own country and slaughter their surplus in the English market itself and in those free territories into which Great Britain has been crowded back and which are free to others as they are to themselves. In other words, consumers in protected countries are to some extent being forced to contribute toward waging a warfare in helpless England's markets—an added injury being that among the most important thereof are Great Britain's own possessions and colonies.

During this period, when Great Britain's supremacy was first challenged and then wrenched from her, her producers passed through years of deep depression with slim profits which discouraged improvement and individual expansion. The great plants had been created by men who had worked up from the bottom. In many cases their sons or grandsons, in possession of ample means, aspired to become gentlemen in the sense of being men of leisure. Unable to understand the necessity for constant improvement, or unwilling to make the necessary sacrifices, they allowed the once efficient plants to drift into the condition of melancholy aggregations of obsolete furnaces and machinery. It is saddening to see in visits to British iron districts, these great old mills often abandoned, in whole or in part. The wrecker, who has been so busy during the last decade in our country, does not seem to play much of a part in Great Britain. Nor do active works appear to be so quick to clear away

antiquated plant as they are with us. The result is that the appearance of defeat is much more marked than it really is, since much of the rubbish of the battlefield is allowed to rot in place.

But the cardinal fact remains that in the last decades very few new enterprises have been started. What has been done, to an extent which is usually underrated, has been a remodeling and an extension of older works. There is considerable activity in that direction now, as evidenced by the fact that such work was going on at every one of the plants visited.

It may be noted in justification of much of what is written by foreign visitors in the United States that these usually confine their inspections to a certain limited number of crack plants and fail to see the very large number of our older works which are laboring under the same disadvantages as their European rivals. Still, taking this into consideration, there is no doubt that with us all are quicker to adopt improvements and, as a whole, much closer up to date.

But even making allowance for all such palliating circumstances, the cardinal fact does remain that the British iron industry shows ample evidence of stagnation compared with that of the United States and of Germany. It may be necessary to insist, in order to avoid any misunderstanding, that this applies to the country as a whole, and that it describes a relative, not an absolute, condition of affairs.

Great Britain has not expanded in recent years. Is she incapable of doing so, owing to natural limitations, or owing to her own lack of vitality, or owing to restrictions raised by others? And if from one cause or the other, or from the co-operation of many of them, it is true that she is bound within certain limits, is incapable of any expansion at all proportionate to the increase in the world's requirements, who is to be the one upon whom will fall the labor and the profit of supplying the steadily increasing demand of the world at large, at a reasonable price? Your correspondent has heard eminent Englishmen, who are familiar with conditions on both sides of the Atlantic, frankly acknowledge that it is to the United States mainly that the world must turn for the bulk of its increased supplies, that our appearance upon the world's markets is not a fact to be dreaded and deplored, but that it is a necessity for the progress of civilization.

It may be well to note that there is some danger of misapprehension in referring to the industry of a country as a unit in such a discussion. As a matter of fact, the iron industry of each country is an aggregation of very heterogeneous units, which may, economically speaking, play or cease to play, under varying circumstances, a constituent part, since the price or the cost of production is the determining factor. For the sake of illustration let us say that 10,000,000 tons of pig iron can be made without loss in the United States at a price of \$9 per ton, that 2,000,000 tons more can be made at \$10, 1,000,000 tons more at \$12, 1,000,000 tons more at \$14, and 1,000,000 tons more at \$18. So long as the market remains at \$10 the other 3,000,000 tons are not obtainable, and the producers below the \$10 mark are the only ones who actually count. Now with us, in the United States, the makers who are running all the time at a profit are constantly increasing their output. In Great Britain there is a certain tonnage which is produced at very low prices, not very far from some of our best, considering cost of laying down in neutral markets, but there does not seem to be that disposition or that ability to increase the quantity, which we may term "*hors concours*." The classes do not seem so closely bunched, nor do individual concerns appear to pass quite so readily from the rear to the front. In other words, the British iron trade has its economically safe and sound individual enterprises and districts. Instances are quoted of small undertakings which through control of raw materials have very low costs of production, and yet the question naturally arising with an American—how rapid is their growth?

—is met with the reply that no expansion has taken place or is contemplated. Usually the reasons given for the absence of growth, with the individual and districts in Great Britain which can meet competition under all circumstances, are much the same which are cited when dealing with the country as a whole. Conspicuous among them are the limitations in the supply of raw materials and the attitude of labor.

For convenience sake it may be well to take up the latter phase, reserving the discussion of the former, since it calls for special treatment for individual districts, and since it is influenced more or less by the labor problem. It is well, perhaps, to note that the unusual conditions now prevailing must be taken into account. They may warp temporarily and unconsciously the judgment of the men at the head of great enterprises. On the other hand, unusual prosperity may be developing latent qualities in the men which a return to normal times may again suppress. This refers particularly to one trait dwelt upon by a number of managers and confirmed in several instances to your correspondent in chats with foremen and gang bosses. It appears that under the stimulus of high wages—they have advanced from 25 to 40 per cent. in the last two years—the number of absentees, notably in the early part of the week, has greatly increased. Drink is responsible for a good deal of the loss of time, some of the men not reporting until Wednesdays. A sensible proportion of British workmen appear to aim at a certain weekly total of wages. If four or five days' work will furnish the sum, the balance of the working days are spent in idleness or debauch. Of course the majority are as ambitious to get on in the world as our American workmen, but there is no doubt that in Great Britain lack of ambition characterizes a larger percentage than with us—a percentage which tells seriously when every nerve must be strained to get out tonnage in times of active demand at remunerative prices.

Labor is very scarce in England to-day, partly because a very considerable number of men are at the front. Your correspondent may confess to some disappointment at the general appearance of the men whom he saw at work in mines and iron plants in different parts of the United Kingdom. They are not the sturdy, vigorous and active class of men whom he expected to see. The clear cut physique of the younger middle class Englishman, the lover of outdoor sports and of constant exercise, is not characteristic of many of the workmen. It seemed difficult to dispel the impression that possibly a century of conquest, colonization and emigration has drained Great Britain of a notable percentage of its best men, leaving a distinctly deteriorated race behind.

Labor in Great Britain in the iron industry is very much more thoroughly organized than it is with us, and accordingly in many districts is much more powerful. The restrictions, however, do not appear to be as arbitrary or as far reaching as they are in other allied branches of the metal industries. The sliding scale, based on selling price of product, determined from the manufacturers' books, is in vogue to a considerable extent.

C. K.

The Hamburg-American Steamship Company's big new transatlantic liner "Deutschland," which broke the westward ocean record on her maiden voyage to New York two weeks ago, has succeeded in breaking the eastward record also. The "Deutschland" sailed from New York July 13 and arrived at Plymouth the next Tuesday morning, making the trip in 5 days, 14 hours and 6 minutes, with an average speed of 23 knots an hour. The best previous record for the trip, that made last year by the North German Lloyd liner "Kaiser Wilhelm der Grosse," was bettered one hour and four minutes by the "Deutschland."

The United States torpedo boat "Barney" was launched on Saturday at the yards of the Bath Iron Works, Bath, Maine. The "Barney" was authorized by the Navy Department in 1898, and her contract calls for a speed of 28 knots on a two hours' trial. She will cost \$170,000.



## Lake Ore Matters.

### Ore Shipments.

DULUTH, MINN., August 6, 1900.—Shipments of iron ore from the Minnesota districts were surprisingly heavy for July, and my estimate last week of 4,500,000 tons for the season to August was exceeded by 330,000. The actual total is 1,425,000 tons higher than last year to the same date. From Duluth alone the business of this season to this time has been 700,000 tons more than for the same period last year, and this harbor is now leading all others on the lakes in its shipments of ore. It is probable that the new port of Michipicoton will add 75,000 tons or more to the total business of Lake Superior this season, and the amount of all rail ore moved during the year will be far more than has been figured. Ore is now going all rail from the Menominee range across Lake Michigan by ferry to the valleys, and from the same range to Chicago, and shipments to that city from Gogebic mines, notably Ashland, have been steady and continuous. There is a decline of shipments from some Marquette and Menominee range mines, and stock pile loading is very slow at some. So that the gross tonnage being moved is less than estimates. But the decline is from smaller mines in chief, and has but a small relative effect on the volume of business. It is stated by mining men that they find a little better inquiry for ores of good grade, and look for new sales, and that the shipment of sold ores is not now hindered as it was a short time ago. The situation is shown to be improved somewhat.

It is probable that many explorations and options taken by large companies on several ranges will be dropped, and that the price of explorations will fall. This is not a sign that ore is not wanted, but rather that the rush for lands was so great that prices were put too high and that some of the companies took under option more lands than they could either handle or mine successfully.

### Mine Valuations.

The St. Louis (Minn.) County Board of Equalization has been wrestling the past week with valuation of mines on the Mesaba and Vermillion ranges, and has finally come to the determination to accept the relative value fixed by the mine operators, raising the list horizontally 10 per cent. This will give a total taxable valuation of about \$7,000,000 for all the mines and ore lands of the Mesaba and Vermillion. The mine operators urged the adoption of a valuation based entirely on output, and gave the board a schedule of probable shipments for this and next year, averaging 9,300,000 tons off the Mesaba and 1,850,000 off the Vermillion. As these operators are not likely to put the figures too high this may be set down as a conservative estimate of outputs from the highest source. As a direct tonnage tax is already decided unconstitutional by the Minnesota Supreme Court the valuation is made by fixing a worth of ore in the ground to be mined in the year at 50 cents and disregarding any additional reserves that may have been opened into or discovered. As a result the assessment, so far as actual values is concerned, is ludicrous.

The specific tonnage tax was at one time the method of getting at values in Michigan, but was dropped, and there is no intention of returning to it, though the Democrats of the State have just adopted a platform that calls for the re-enactment of the tonnage tax.

That the Carnegie Steel Company have definitely and finally given up any idea of constructing a railway from Minnesota mines to the lake is evident. The company have just subleased their Stevens ore body of 30,000,000 tons or so to the Consolidated Mines (Rockefeller) without change in the terms or conditions of the lease. This following close on the sale of their half interest in the Roucheleau ore deposit of 20,000,000 tons more simply means that a traffic contract has been made between the two concerns as to the haul of these and possibly other mines in addition to that covering the mines where there has been such a contract for some time past. The Carnegie interests now hold but comparatively little ore on the Mesaba not covered by traffic agreements with Mr. Rockefeller. Just what the significance of this is, in a broad way, no one here is able to say, but it must be considerable and far reaching.

On the Marquette range the force at Star West (Corrigan) has been reduced by about half, and only the better grade of ore is to be mined for the present. Shipments from stock piles at Negaunee and Ishpeming are reduced, and at some mines the regular daily hoist covers what is sent forward. At the Hartford (Carnegie) considerable ore is being stocked and the new and old shafts are being connected. Mine buildings are going up and heavy machinery is to be installed. The Moore Mine (A. S. & W.) has reduced its force for a few weeks, but will resume development as soon as some timbering is done. The Negaunee, of the same company, is increasing its output, and the late wreck there is about recovered. The

Rolling Mill Mine, owned now by Jos. Sellwood of Duluth, has been renamed the Chester, and is pushing for a considerable output in the future. The various mining interests of Captain Sellwood, at the Chester, at Sunday Lake district, on the Gogebic, and in the Colonial and Roberts companies of the Mesaba, will put out about 500,000 tons this year. These will make this well-known veteran miner an important figure in the output, as he was before his identity became merged in the Minnesota Iron Company. It is reported that the Princeton (Pickands, Mather & Co.) is to cease, but it is looking well, and more ore has been shipped so far this year than in any season since its opening. At the North Champion power drills are at work underground, and all the new machinery outfit is in use. At Riverside Mine (Carnegie) sinking is at last commencing in the two old shafts, which are now 156 and 211 feet deep. Diamond drills have been purcuturing the ground there for three months, with very satisfactory results. A new surface outfit of buildings and machinery has been installed. It is expected the Riverside will prove a continuation of the Republic ore body, and a large one.

A steel shaft house will be erected at the Blue, Regent group, Negaunee. It is the first headworks of the kind to be erected by the Oliver Company, and is understood to be the inauguration of a policy of placing steel houses at all mines of the company as fast as old wood structures require replacement. This shaft house will be a standard pattern, and the Carnegie Steel Company will furnish shapes for all future buildings of the kind at the Oliver mines on all ranges. As the company are operating a great number of shafts at their various mines on all ranges this means an important change.

At the two Amasa properties, Gibson and Michigan, little shipping of ore is done, both being developed for the future. At the Michigan the old and new shafts have been connected by a drift.

### Lake Copper Notes.

New timbering will be required in No. 2 shaft, Hecla, at the Calumet & Hecla, where the recent fire originated. Below the eighth level the old timbering is ruined, and it may take two years to replace it. The shaft is 3900 feet deep. The company are erecting 100 dwellings for employees, and will commence a second 100 at once.

It is probable that a smelter will be erected for the various mines under the Stanton management, including the Atlantic, Baltic, Mohawk, Michigan, Wolverine and some others. Calumet & Hecla, Quincy and the Tamarack-Osceola group now have the only smelters on the lake.

Franklin has installed a new hoist capable of raising 22 tons of rock per hour from 3900 feet down. Already the mine has increased its daily production materially.

The Osceola will add to its three-stamp mill four stamps more, and will later put its old mill out of commission. The addition will be a steel structure on Torch Lake.

The Mass, Adventure and Wolverine mines will build stamp mills of large size and the most modern design. The Mass has let the contract for its structure, which is to house two stamps, to the Wisconsin Bridge & Iron Works of Milwaukee. Money has been raised for the Adventure mill.

D. E. W.

### New Water Works at Constantinople.

The *Bulletin Commercial* of Brussels is responsible for the statement that the Sultan has issued an irade, according to which the city of Constantinople is to have a new water works system and sewerage, to be constructed at the expense of the Imperial Civil List. The undertaking will require, it is said, the purchase of considerable quantities of pumping machinery and of all necessary material, including among other items 4200 m. of cast iron pipe of a diameter of 300 mm., 1200 m. cast iron pipe of a diameter of 220 mm., and 6300 m. cast iron pipe of a diameter of 250 mm. All these pipes are to have a power of resistance of 15 atmospheres of pressure. Furthermore, there will be required 2300 m. of pipe of a diameter of 225 mm., able to resist a pressure of 25 atmospheres.

American manufacturers should try to secure a share of these orders. Turkey is a good market for iron pipes and tubes, the import of which averaged during the last five years some \$1,000,000 annually. So far the bulk has come from Austria, Germany and Great Britain. That the United States is, however, able to compete in this trade is best shown by our shipments during the last two years. While in 1898 our exports of pipes and fittings to Turkey in Europe amounted in value to only \$625, they rose to \$12,494 in 1899. Progress has also been made in our exports of pumps and pumping machinery to European Turkey, they having risen from \$1471 in 1898 to \$2014 in 1899.



### The Castner Electrolytic Plant at Niagara Falls.

In the early stages of the Niagara power development it was freely and frequently predicted that the locality would become a vast electro-chemical manufacturing center because of the apparent possibilities for the development of electric power in stupendous units and at a cost so cheap that it would be beyond the competition of other places where smaller water powers exist. The few years that have passed since the first dynamo was operated have supported that belief, and several large and prosperous concerns of this nature have found it profitable to be located there.

Among these is the Mathieson Alkali Works, which company own a very large caustic soda and bleaching powder plant, located just east of the central station on the lands of the Niagara Falls Power Company. This plant is managed by Benjamin F. Thurston, and its success has been such that the Castner Electrolytic Alkali Company have been organized to buy out the Mathieson Alkali Works at Niagara Falls. A subscription to an issue of \$1,000,000 first mortgage debentures of this new company has just been closed in London. This money is to be used in adding to the output capacity, and the expectation is that the improvements to be made by the Castner Electrolytic Alkali Company will amount to

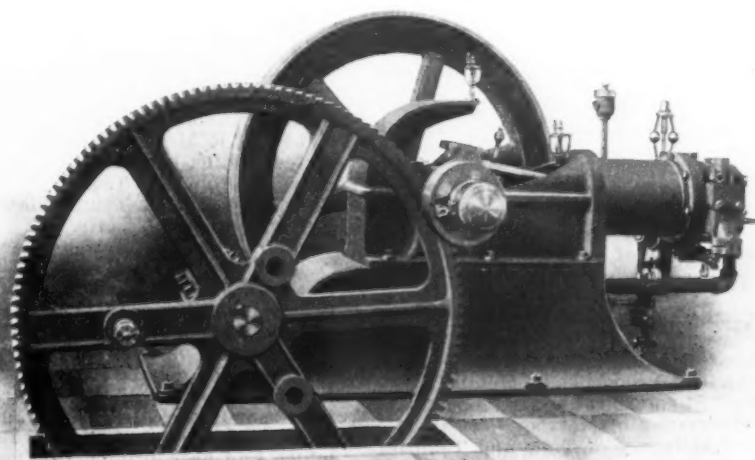
that time they have been in full work and reached a very high degree of efficiency. They have also shown earnings proportionately greater than those of the Castner-Kellner Alkali Company in England, owing chiefly to the low cost of power generated by water under the exceptional conditions under which the installation of the Niagara Falls Power Company are operated. It is frankly stated that the profits from the present plant are largely in excess of the entire interest charge upon the issue of debentures above referred to.

It is further stated that when the company start to use the additional 4000 electrical horse-power that a reduction will be made in the price per horse-power, owing to the larger amount consumed, which fact will further add to the company's earnings. The Mathieson Works at Niagara Falls now employ 200 hands, and when the additions to the plant are made this number will be nearly trebled, it is expected. The enlargement to the plant will in all probability be made on the east side of the present works, where there is ample room for extensive buildings.

O. E. D.

### The Stover Deep Well Gasoline Pumping Engine.

The deep well gasoline pumping engine illustrated is built by the Stover Engine Works of Freeport, Ill. The



THE STOVER DEEP WELL GASOLINE PUMPING ENGINE.

\$750,000, which will leave ample working capital for the carrying on of the business.

The Castner Electrolytic Alkali Company have been formed to acquire the property and the buildings, plant and machinery of the Mathieson Alkali Works at Niagara Falls and the Castner patents for the United States and Canada; also to carry on the manufacture of caustic soda and bleaching powder under the Castner electrolytic process. The purchase price to be paid by the Castner Electrolytic Alkali Company to the Mathieson Alkali Works, the vendors, is to be satisfied by the allotment of the whole of the ordinary share capital. The purchase price includes the stock in trade and the good will.

At present the Mathieson Alkali Works is consuming 2000 electrical horse-power, and when the projected extensions and improvements have been made the plant will use 6000 electrical horse-power, which means that the output capacity of the works will be trebled. The Castner process is famous. It has been demonstrated a great success and has been worked in England by the Castner-Kellner Alkali Company, who for the last two years have paid dividends on their ordinary share capital of \$1,500,000 of 8 per cent. per annum, after paying 1½ per cent. per annum on their debenture issue of \$750,000.

The Mathieson Alkali Works at Niagara Falls have been erected since the construction of the works in England of the Castner-Kellner Company, for working the same processes, and mutual benefits have been derived from co-operation between the two establishments under agreements for the mutual interchange of any improvements made in the process. As stated, the Niagara Falls Works were fully equipped with the adequate power for their continuous operation with 2000 electrical horse-power and a maximum output in October last. Since

main characteristic of the engine is the method by which the gasoline is converted into a gas, by an injector controlled by the governor. The gasoline is injected in a fine spray with the air as it enters the cylinder. This method results in a very good mixture, and the charge is of uniform richness throughout. The water jacket is separate from the engine and can be removed without disturbing any of the working parts. The large gear is driven by a pinion on the main shaft and is provided, in its arms, with three wrist pin seats, giving three different lengths of stroke to the pump plunger. The engine is provided with a powerful friction clutch.

The Pennsylvania Company, operating the Pennsylvania lines west of Pittsburgh, have secured options on 75 acres of land at McKees Rocks, adjacent to the large works of the Pressed Steel Car Company. The site will be used for new freight yards, shipping departments and a round house. It is the desire of the Pennsylvania Company to put themselves in position to handle the large tonnage coming from the plants of the Pressed Steel Car Company, the Pennsylvania Malleable Company and others that are located in and about McKees Rocks. It is also desired to be ready for the heavy tonnage that will come from the new blast furnace of the American Steel & Wire Company, that is now being built on Neville Island. This furnace is to be followed by others, and also by the building of steel plants and wire mills.

The American Sheet Steel Company have appointed F. A. Goodrich & Co., Chamber of Commerce, Detroit, Mich., district sales agents for the State of Michigan and Toledo, Ohio.

# The International Congress on Testing Materials of Construction.

Among the many technical congresses which are being held under the auspices of the Paris Exposition, perhaps the most interesting one, to the readers of *The Iron Age*, so far convened, is the Congress on Testing Materials, which was in session from July 9 to 16. It brought together many prominent men from all countries.

Forty-six papers were presented to this congress. Of these only 25 were ready for distribution in pamphlet form during the sessions of the congress. A few of the papers not printed were read by the authors from their manuscripts, but the majority were simply read by title. The volume containing all the papers, with oral and written discussion thereon, will not be ready for distribution to subscribers to the congress for some months. When published, it will form a very valuable addition to the literature of the important subject of testing materials.

Nine of the 46 papers may be classified as on the general subject of testing materials or metals, as follows:

- Rejtö, M. A.—"Rational Methods of Testing Materials of Construction, Based upon the Mechanical Laws of Molecular Action and Internal Friction."  
 Debray, Paul.—"On the Communication of M. Frémont, 'Evolution of Methods of Testing.'  
 Olliver, M. A.—"Study of the Resistance of Materials."  
 Mesnager.—"The Deformation of Solids; The Interpretation of the Laws, Mechanisms and Results Obtained in Their Testing."  
 Ricour.—"Study of the Molecular Constitution of Bodies."  
 Charbonner, P., and Galy-Aché, Ch.—"Study of the Physical and Mechanical Properties of Metals."  
 Hartmann, Captain.—"Phenomena which Accompany the Permanent Deformation of Metals."  
 Le Chatelier, Andre.—"Influence of Time and Temperature on the Mechanical Properties and Tests of Metals."  
 Trélat.—"Plasticity of Materials."  
 Eighteen of the papers deal with cements, mortars, stone, slate, wood, oils, greases, and copper; the authors and titles of these papers are as follows:  
 Le Chatelier, H.—"On the Decomposition of Cements by the Sea."  
 Rebuffat, O.—"The Use of Pouzzolane Cement in Navy Construction."  
 Chouliatchenko, A. R.—"On the Action of Sea Water on Hydraulic Mortars."  
 Deval.—"Tests of Cement with Hot Water."  
 Feret, M. R.—"Observations on Moist Testing, with a view to Determine the Chemical Constitution of Hydraulic Bodies."  
 Feret, M. R.—"New Methods of Testing Pouzzolane Cement."  
 Feret, M. R.—"Researches on the Resistance to Rupture of Isotropic Non-Ductile Materials. Application of This Method of Testing to Stone, Mortars, &c."  
 Considère.—"Methods of Testing Constructions Made of Béton (Stone and Cement) Stiffened with Iron."  
 Mayer, J. Marva.—"On Some Details of Execution in the Testing of the Winter Weathering of Stone."  
 Thil, Andre.—"Study of the Fracture of Wood Obtained in Resistance Tests."  
 Tavernier, M. H.—"Melted Metallic Joints for Masonry."  
 Quillot.—"Physical Analysis of Portland Cement."  
 Pace, P.—"On the Resistance of Stony Materials."  
 Forti.—"Disintegration of Cements."  
 Autissier.—"Tests of Slate."  
 Pétroff, General.—"Tests of Oils and Greases."  
 Demenge.—"Tests of Copper and Its Alloys."  
 Brüll, A., and Henry, H.—"Cement from Blast Furnace Slag."

Four papers dealt with descriptions of testing laboratories, as follows:

- Masson, Leon.—"The Organization, Apparatus and Work of the Department of Experiments and Tests of the National Conservatory of Arts and Trades."  
 Derray.—"The Laboratory of the National School of Bridges and Roads."  
 Herzenstein.—"A Railroad Testing Laboratory."  
 Hatt, Professor.—"Apparatus of the Laboratory of Purdue University."

The following 15 papers related more directly to the specifications and methods of testing iron and steel:

- Colby, A. L.—"Review of the American Standard Specifications, Test Pieces, and Methods of Testing Iron and Steel, Adopted by Committee No. 1 of American Section of the International Association for Testing Materials; With a Discussion of the Commercial Methods for the Physical and Chemical Testing of Iron and Steel in Use in the United States; and A Critical Review of Foreign Rail Specifications for Steel Rails."  
 Howe, H. M.—"Relative Corrosion of Wrought Iron, Soft Steel and Nickel Steel."  
 Webster, W. R.—"International Specifications and Methods of Testing from an American Engineer's Standpoint."  
 Pourcel, Al.—"Definition of Pig Iron, Iron and Steel."  
 Guillaume, Ch. Ed.—"Nickel Steels."  
 Brown, W. L., and Porter, H. F. J.—"Nickel Steels."  
 Le Blant.—"Stay Bolts for Locomotive Fire Boxes."  
 Lanna.—"Results of Experimental Studies of Metallic Bridges."  
 Seefehlner.—"The Cables of the Suspension Bridge Across the Danube at Esküter, Budapest."  
 Brinell.—"Method for the Determination of Hardness and Ultimate Stress by means of 'ball tests.'"  
 Thurston, R. H.—"Application of a Pendulum Apparatus for Testing by Shock."  
 Baclé.—"Punching Tests."  
 Charpy.—"Note on Temper Tests."  
 Rateau.—"Torsion Tests."  
 Henning, G.—"Portable Registering Apparatus for Testing Materials."

Of these 15 papers, the most important presented by foreigners were those of Guillaume, Le Blant, Brinell, and Lanna. Abstracts of these will be published in a subsequent issue, and the present report of the congress will be confined to a description of the three important papers read by Americans—namely, those of Professor Howe, A. L. Colby and W. R. Webster.

Mr. Colby read the following abstract of his paper, which had been printed in America in English, French and German, and which he had previously distributed to all the members of the congress:

## I.—Review of the Proposed American Standard Specifications, Test Pieces and Methods of Testing Iron and Steel.

Specifications governing the chemical and physical properties of iron and steel for specific purposes may very properly be made the subject of international agreement. There are certain general requirements which such international specifications should include, and there is a class of requirements which should be omitted.

International specifications should name the process or processes of manufacture by which the steel for a given purpose shall be made; they should not, however, prescribe the details of the process, as the methods of manufacture, producing a satisfactory product, vary in the different countries. They should include limits in certain of the chemical constituents of the steel, particularly phosphorus and sulphur for both acid and basic steel, and they should prescribe limits in all physical properties which materially aid in showing whether the steel is suitable for the purpose intended.

International specifications should also describe the shape, number and location of the test specimens, and give general methods for determining the physical properties specified; they should also mention how the sample for chemical analysis shall be taken. They should contain clauses governing the required finish and branding of the material, and finally a clause granting the inspector the necessary facilities to carry out the provisions of the specification.

The text of ten specifications drawn on the above lines are given as an appendix to the paper. These specifications have been framed by a committee of 31 members, who were carefully selected so that all interests would be equally represented.

Part of the work of the committee included the tabulation of the existing American specifications, and each subcommittee included the best features of these existing specifications when framing these proposed American standard specifications. The reports of the subcommittees have been discussed at frequent meetings since March 9, 1899, and the final vote on each specification

was taken on May 1, 1900, by letter ballot, a very large majority voting that these specifications were representative of the best American practice.

The committee are desirous that their work shall receive criticism from all interests represented. Their proposed standard specifications, together with tables showing the principal features of existing specifications, have therefore been printed in the form of ten bulletins.

Some of these ten specifications were discussed at the monthly meeting of the American Society of Civil Engineers, May 16. They were made the subject for discussion at the spring meeting of the American Society of Mechanical Engineers, held in Cincinnati in May. At both these meetings these bulletins were liberally distributed. They will be discussed at the summer meetings of the American Railway Master Mechanics' Association, the American Institute of Mining Engineers, and other technical societies. They have also been reviewed by the leading technical papers of America.

A list of these ten specifications is as follows:

Steel castings.  
Steel axles.  
Steel forgings.  
Steel tires.  
Steel rails.  
Steel splice bars.  
Structural steel for buildings.  
Structural steel for bridges and ships.  
Open hearth boiler plate and rivet steel.  
Wrought iron.

The requirements contained in the nine specifications for steel are described and discussed in the paper under the uniform headings found in each specification, a plan which will materially aid in their comparative study. The specification for wrought iron is referred to independently.

These ten specifications are presented to the International Congress on Methods of Testing Materials of Construction with the recommendation that, as they are being very generally discussed in America with a view to their adoption as national standards, they also be studied and discussed by this congress with a view to their future adoption as a basis for international standard specifications.

The critical review which it is hoped they will receive at this international congress will be of great service to American engineers and manufacturers next fall, when these specifications will be discussed in America, prior to their adoption as national standards.

Pages 3 to 27 of the French pamphlet, which the author has had printed and distributed to the delegates of this congress, contain a review of these proposed American standard specifications for steel arranged under the following headings found in each specification:

1. The Processes of Manufacture Specified.
2. The Chemical Properties Specified.
3. The Physical Properties Specified.
4. The Test Pieces and Methods of Testing Specified.
5. Variation in Weight of Plates.
6. Finish.
7. Branding.
8. Inspection.

#### II.—The Actual Every Day Practice of American Steel Works in Determining the Physical Properties of Iron and Steel.

The American commercial methods of testing were ascertained by the replies to a circular letter addressed to 33 steel companies, makers of over 75 per cent. of the open hearth and Bessemer steel produced in the United States.

The writer compares these American commercial methods, whenever possible, with the conclusions in reference to the testing of metals adopted in 1894 by the French Commission on Methods of Testing Materials of Construction, appointed on November 9, 1891, by a decree issued by the President of the French Republic; and with the resolutions of the International Conventions held in Munich in 1884 and 1885, in Dresden in 1886, in Berlin in 1890, and in Vienna in 1893.

The comparison shows that the limits of accuracy in the commercial American methods for determining the physical properties of iron and steel compare very favorably with the recommendations of the International Congress and the French Commission.

#### III.—Methods in Use in American Steel Works for the Chemical Analysis of Steel.

In this chapter all methods in use in American steel works laboratories, by means of which satisfactory analytical determinations of the various constituents of steel are made, are not given, as it is far beyond the scope of the paper.

The methods described are known by the writer to

have long been in successful use, and were selected because they combined accuracy with speed in analysis.

Element.	Name of method.	Time required.	Accuracy. Per cent.
Carbon .....	Shimers' gravimetric...	2 hrs. 20 min.	0.005
Carbon .....	Eggertz calorimetric...	12 minutes.	0.01 to 0.03, depending on amount of carbon present.
Manganese.....	Williams' volumetric method.	30 minutes.	0.01
Manganese....	Dushay's volumetric method.....	12 minutes.	0.02
Silicon.....	Drown's gravimetric method. ....	30 minutes.	0.005
Phosphorus. .	Drown's-Emmerton volumetric method	30 minutes.	0.002
Phosphorus. ....	Handy-Manby volumetric method..	10 minutes.	0.003
Arsenic.....	Gravimetric method....	12 hours.	0.003
Sulphur.....	Aqua regia gravimetric method.	6 hours.	0.002
Sulphur .....	Volumetric method .	30 minutes.	0.005
Nickel. . . . .	Electrolytic method....	2 hours.	0.02
Chromium.....	Volumetric method....	2 hours.	0.02
Copper.....	Electrolytic method....	6 hours.	0.002
Tungsten.....	Gravimetric method	12 hours.	0.04
Slag and oxides.	Eggertz gravimetric method.....	6 hours.	0.02

#### IV.—Critical Review of Foreign Specifications for Steel Rails.

This chapter is of practical commercial interest to the consulting engineers of railroads, who are desirous to obtain good, and at the same time low priced, rails.

Forty-one prominent foreign rail specifications were studied, and their requirements compared with those contained in the proposed American standard rail specification.

The author points out that there are a number of requirements in foreign rail specifications wholly unnecessary in view of the present state of the art, yet which act as hardships to the manufacturers because they delay manufacturing operations, and hence add to the cost and price of the product.

#### V.—Appendix.

In the appendix of the paper the full text of the ten proposed American standard specifications are given. The author of this paper sincerely trusts that the presentation of this review of these specifications at this congress will result in giving American engineers and manufacturers the benefit of foreign criticism of their proposed standards.

M. Greiner, the honorary president, stated that the practical common sense of Americans is shown by their willingness to make mutual concessions for the sake of uniformity in tests. The subjects presented by Mr. Colby were interesting and far reaching and he hoped all the members present having any comments to make would feel free to do so.

M. de Gennes, mining engineer, stated that Mr. Colby had presented a very thorough *résumé* of the specifications for steel which had been framed by an American committee representing all interests, and which are to be proposed for adoption as national standards; and as Mr. Colby has made a special request that they receive foreign criticism at this congress, he considered himself at liberty to call attention to one way in which they could be greatly improved—namely, by a slight change in the dimensions of the two standard test specimens recommended, so that they will be based on the metric system and their principal dimensions be in even metric units.

M. de Gennes stated that it had been his good fortune to visit the mining regions of many countries, including the United States, and to study their commercial relations, and this experience had convinced him of the necessity and advisability of the English speaking countries adopting the metric system. In his opinion they



must come to it sooner or later, and if the Americans desire their specifications to be the basis of international standards, and desire to introduce their steel into foreign markets, they must give up their present superannuated system of weights and measures.

The American committee should take the initiative in this matter, and be contented to employ for themselves during a space of time (very short, it is to be hoped) the inches and fractions of an inch corresponding to the gauged length of the two standard test specimens based on even metric measurements. They will thereby render their country a great practical service by hastening the adoption of the metric system and thus save both work and time, the two constituents of modern industry. They will thereby join, with the best practical results to themselves, their American motto of "Go ahead," with our French motto, "Foresee and prepare."

William R. Webster said he would like to call attention to the report of the English committee appointed by the Board of Trade to inquire into the loss of strength in steel rails through use on railways.

He quoted the following from Appendix VII of this report: "It is probable that the Board of Trade will expect or desire the committee to recommend an analysis for the guidance of engineers and manufacturers, which shall in the judgment and experience of the committee be the composition of the steel to insure a safe and good wearing rail. I therefore suggest, after careful consideration from the points of view of a manufacturer and user, that, exclusive of the iron, a steel rail should have the following range of composition:

	Minimum.	Maximum.
Carbon .....	0.35	0.50
Silicon .....	0.05	0.10
Sulphur .....	0.04	0.08
Phosphorus .....	...	0.08
Manganese .....	0.75	1.00

"Edward P. Martin of Dowlais considered these suggested figures with me, and approves them.

[Signed] "E. WINDSOR RICHARDS.

"EVESHAM, March 7, 1899."

The full requirements of the American committee for rails of from 50 pounds to 75 pounds per yard are as follows:

Carbon .....	0.35 to 0.50
Silicon .....	Not over 0.20
Sulphur .....	...
Phosphorus .....	Not over 0.10
Manganese .....	0.70 to 1.05

These English and American recommendations are remarkably close.

M. Grobot thought that chemical specifications should not be included. Analyses made at different laboratories did not agree; physical properties were what were desired, and other than perhaps limiting the prejudicial substances, phosphorus and sulphur, he did not think it wise to include chemical requirements in steel specifications.

M. Roussel agreed with M. Grobot. He thought that the bending test mentioned in the American specification for steel castings should not definitely specify the angle through which the steel must bend.

M. Le Chatelier thought that the impression that the more numerous the requirements in a specification the better the consumer was protected was an error. Where many tests were required the tendency was to make them hurriedly, and it would be far better to specify a few important requirements and make the tests on these very carefully.

As to steel castings, he thought that homogeneity and freedom from flaws, as determined by micrographic tests, a much more important test than either elastic limit or elongation. He agreed with M. Grobot as to omitting chemical requirements and was even willing to go further and advise omitting the phosphorus and sulphur requirement. In general, specifications should be limited to only the important requirements which can be accurately determined.

M. Grobot explained that in speaking of sulphur and phosphorus he had not wished to convey the impression that limits should always be specified, but merely that if analyses were required at all, they should be confined to these two elements. In general, he objected to prescribing analyses of any sort in steel specifications. Even in reference to carbon, its determination was uncertain, depending upon the condition in which it existed in the steel. In his opinion, specifications should include the same sort of tests as those which the material receives in service.

M. Roussel thought that to specify a maximum carbon for rails and tires, and also a drop test, made up a very satisfactory specification, and sufficient to eliminate material too high in phosphorus; at least such had been his experience in testing rails and tires in Belgium.

M. Greiner thought that when the mechanical requirements of a specification were met the chemical requirements were useless. He asked what difference does it make whether a steel is high or low in sulphur

provided it stands the physical requirements? Also, why should a specification confine the manufacturer to Bessemer or open hearth steel, provided the physical requirements were met? When we sit down to a meal, do we ask our cook to what religion he belongs?

M. Pelletier wished to call attention to the fact that molecular change might take place in material after service, especially from vibration, which would bring about a decided change in the physical properties of the metal over that found when the steel was tested originally. M. Considere cited a case within his experience, which supported M. Pelletier's statement. M. Le Chatelier thought, on the contrary, that vibration produces no difference in grain. He based this opinion on the examination of axles before and after service. M. Le Blant spoke of his experience in railroads where he had found cracked sheets in service which originally had stood all tests satisfactorily. M. Mesnager thought that some had exaggerated the evil effect of vibrations on metal. He had tested plates of a bridge after 30 years' service, and found them to stand the same tests as shown by the old records of the original tests of the material. M. Belehinsky quoted his experience with chains from a bridge in Kiev. Some extra pieces of chain which had never been in service, gave the same tests as pieces of chain from the bridge which had been built over 30 years.

M. Le Chatelier did not think the elastic limit need be specified except in exceptional cases, where a minimum requirement might be included in the specification. M. Roussel said he was surprised that the American specifications limited axles to open hearth steel. In his opinion this was an unnecessary requirement, as long as the finished material met the physical requirements. M. Le Blant was surprised that the drop test on axles, in America, was made on the middle of the axle, which receives the least work in service. For a number of reasons he thought the end of the axle should be submitted to the test.

M. Pelletier thought that railway companies were perhaps justified in specifying a certain process of manufacture, known to give uniform product, inasmuch as there was always more or less uncertainty in the methods of testing employed when inspecting the material. M. Grenier disagreed with M. Pelletier. With other good methods for making steel, why specify only open hearth steel? Even a better method may be invented to-morrow. He would ask his American friends not to insist that this clause of their specifications be adopted abroad.

M. Roussel believes in the drop test for tires and thinks the tensile test unrepresentative. M. Foulon thought the Americans had made a mistake in omitting the tensile test in the rail specification. Chemical tests are at best unreliable, so there should be some check on the drop test. M. Greiner disagreed and thought that the drop test was a species of tensile test, especially if a certain deflection, for different weight rails, was specified. Mr. Sandberg's latest specification for rails, and his authority is unquestioned, includes a chemical test as a preliminary indication, followed by a drop test which, to Mr. Sandberg's mind, really determines the quality of the rail.

Mr. Colby, in closing the discussion, said: There has been considerable criticism to the effect that these proposed American standard specifications contain too many and too severe requirements, and special mention has been made of the high elastic limit called for in some of the specifications. Many of the gentlemen have expressed as their belief that the chemical requirements included in all of the specifications should be omitted. In general, I may say that I am in entire sympathy with the above criticisms, for from a long personal experience I am strongly convinced that just as good steel will be furnished by American manufacturers on specifications in which many of the requirements contained in these ten specifications are omitted. Many American engineers are also willing to admit that a number of the requirements in existing specifications are, in view of the present state of the art of making steel, entirely superfluous.

The American steel manufacturers were so anxious, however, to have national steel specifications adopted in America that they joined with the engineers in framing these ten specifications, the full text of which is given as an appendix to my paper, and voted in favor of the specifications in their present form; and they now stand ready to meet all the requirements contained therein for either domestic or foreign customers, an attitude which I imagine from the general character of this morning's discussion is far more than the foreign steel makers are willing to agree to.

I am grateful to M. de Gennes for his criticism reminding the Americans that if they desire their specifications to be adopted as the basis of international specifications, and further, if they desire to enter foreign markets they must slightly modify the sizes of the two standard test pieces recommended in their proposed spec-

ifications, so that they will be based on the metric system. It would require but a slight change in the dimensions of either the 2-inch test specimen or the 8-inch test specimen to make the chief dimensions in even millimeters instead of as at present in millimeters and fractions of a millimeter. This change, I am sure, the American engineers and manufacturers would be willing to make, particularly if by so doing they could secure the benefits suggested by M. de Gennes.

One of the gentlemen taking part in the discussion spoke of the danger of using steel of too high an elastic limit. In America we favor using a higher carbon steel for castings and forgings, for instance, than is often used in other countries, for, from the result of quite a wide and varied experience, we are convinced that by the adoption of a higher carbon steel, which we are careful to submit to a thorough annealing, we obtain a material much better capable to withstand repeated strains.

Prof. Henry M. Howe read a paper on the

**"Relative Corrosion of Wrought Iron, Soft Steel and Nickel Steel."**

The facts presented were based on the determination of the loss of weight by oxidation of several plates of wrought iron, soft steel, 3 per cent. nickel steel and 26 per cent. nickel steel, after an exposure to sea water, river water, and also to the weather, for two periods of about one year each. Each of the plates was about 24 inches long, 16 inches wide and  $\frac{1}{2}$  inch thick, the total weight of all the plates was 2597 pounds, and the total area exposed was 928 square feet. Professor Howe stated that the scale of these requirements was therefore not only much larger than that of any previous experiments of which he knew, but also larger than that of all previous experiments taken collectively. His paper includes tables and comparisons of all previous accessible reliable investigations on this subject.

Professor Howe sums up the results of his experiments in the following table:

*Relative Corrosion of Soft Steel, Wrought Iron and Nickel Steel; Wrought Iron Taken as a Standard.*

	Sea water.	Fresh water.	Weather.	Average.
Wrought iron.....	100	100	100	100
Soft steel.....	114	94	103	103
3 per cent. nickel steel..	83	80	67	77
26 per cent. nickel steel.	32	32	30	31

He therefore found that soft steel corroded less than wrought iron in fresh water, but more than wrought iron in sea water; the difference, though always moderate, was in each case sufficiently constant to raise a considerable presumption that it was a real and not merely an apparent one. In Krupp's very important experiments the opposite results were obtained, for soft steel corroded much less than wrought iron in sea water; and here, too, the difference was so constant as to raise a considerable presumption that it was real, and not merely apparent.

Professor Howe draws two inferences:

1. That the difference in the rate of corrosion between wrought iron and soft steel is rarely enough to be of great moment except perhaps in marine boilers;
2. That the ratio of the corrosion of a given soft steel to that of a given wrought iron may vary greatly with the conditions of exposure.

He suggests two chief causes for the apparent discrepancies between the results not only of different observers, but even of the same observer.

1. The quasi accidental variations, individual peculiarities, &c.
2. That the susceptibility to corrosion of soft steel taken as a whole does differ somewhat from that of wrought iron taken as a whole; but that this difference is of such a nature that wrought iron as a class corrodes, on an average, faster than soft steel, under certain conditions, but slower than soft steel under others.

He referred to the strong and widespread belief, at least in the United States, that soft steel corrodes much more rapidly than wrought iron, and stated that this belief has greatly retarded the introduction of soft steel for tubes and other purposes in which oxidation is a matter of vital importance; and stated that, having before him the results of such extensive experiments indicating the reverse of this belief, he was led to study the cause of the discrepancy.

He looks upon the cinder of wrought iron and the cementite of soft steel as offering a protection to the pure iron or ferrite. The particles of ferrite on the surface are, of course, in each case, oxidized at once, but it may be possible that the mechanical protection of the flakes of cinder in the wrought iron increases with time much more than the flakes of the cementite of soft steel, so that it is quite possible that though wrought iron and soft steel corrode at the same rate initially, yet later, the wrought iron should oxidize much less than the soft steel. He stated that fortunately data for testing this hypothesis were at hand; for in his own experiments and in another very extensive series the oxidation of soft

steel and of wrought iron for each of two successive long periods was given. Comparing these, he does not find that the oxidation of the soft steel accelerates relatively to that of wrought iron, as the period of exposure continues. The hypothesis is therefore weakened, and he has hence concluded to continue his experiments by re-exposing all the plates, and he hopes to reweigh and report on them again after a further period of several years.

Referring finally to the nickel steels, he stated that the above table showed that on a general average the 3 per cent. nickel steel corroded 77 per cent. as fast as wrought iron, and the 26 per cent. nickel steel about one-third as fast. The superiority of the 3 per cent. nickel steel, though decided, is hardly enough to weigh heavily in determining its introduction. The 26 per cent. nickel steel, while having an enormous advantage over wrought iron and soft steel as regards corrosion, can still not be classed as a non-corroding metal under common conditions, but simply as a slowly corroding one.

William R. Webster of Philadelphia presented a paper entitled

**"International Specifications and Methods of Testing from an American Engineer's Standpoint."**

He stated that at this international congress, where investigators, engineers and manufacturers met on a common ground, much valuable preliminary work could be done toward standardizing specifications and methods of testing iron and steel. He considers that the principal points for discussion are:

1. The best requirements for heavy plates.
2. Whether axles, tires, forgings and castings should or should not be annealed.
3. Whether cold bends should be required in all cases for soft steel, as quench bends alone are not reliable.
4. The proper gauged length for test pieces.
5. The proper percentage of elongation.
6. The value of reduction of area as a check on quality.
7. Whether the elastic limit at present specified is too high or not.
8. Whether or not upper and lower limits of tensile strength should be required in all cases.
9. The value of proper reductions and finishing temperature in rolling; material being injured if too heavy presses are taken in rolling and the second heat brought out.

He stated that it is necessary to allow steel to cool after rolling or forging before it is heated for annealing. If treated otherwise, it will be made worse instead of improved. Also that it would be desirable to know whether the change from the fine grained tough steel to the coarse grained brittle steel, takes place while it is being heated up, or while it is cooling; the matter of vital importance is to work the steel so that it is not put in service in the latter condition.

Referring to rails, he stated that the difficulties in rolling flanged rails are increased with the increase in weight of the rail and the increase of carbon, and may require more metal in the flange and web to carry the heat and allow lower finishing temperatures, in order to produce a fine, tough structure in the head.

**The Tin Plate Scale.**

After the conference between wage committees representing the Amalgamated Association and the American Tin Plate Company, held in the Battery Park Building, New York City, last week, the report was printed that the tin plate scale had been signed, but that this was being kept secret for certain reasons. When the Amalgamated Association delegates reached Pittsburgh and found that this report was in circulation, they became very indignant and branded it as untrue. An official statement concerning the matter was also issued, reading as follows:

"We, the Tin Conference Committee of the Amalgamated Association of Iron, Steel and Tin Workers, emphatically deny the reports printed in three Pittsburgh papers on Wednesday, August 1, that the tin plate scale was signed in New York and that the Conference Committee was in collusion with the American Tin Plate Company to keep the settlement quiet until they would meet the organization of washhousemen in Cleveland. The report that President Shaffer was in Pittsburgh on Wednesday morning is false and is only calculated to hurt him and the organization in general. The committee was in session up to 4.30 o'clock on Thursday evening and only arrived in Pittsburgh on this date, where they are still continuing their deliberations."

This was signed by the following members of the Tin Conference Committee: T. J. Shaffer, president, Pittsburgh; John Williams, secretary, Pittsburgh; David Reese, Pittsburgh; Walter Larkin, Martin's Ferry, Ohio;



Charles Williams, Washington, Pa.; Harry H. Evans, Cambridge, Ohio; J. L. Doyle, Middletown, Ind.; John W. Marshall, Ellwood City, Pa.; Clem Jarvis, Anderson, Ind.; William H. Davis, Granite City, Ill., and John Chappell, New Castle.

The conference between the committees of the Amalgamated Association and the American Tin Plate Company was resumed in Pittsburgh on Monday, August 6, and it was expected that the scale will be settled this week.

### Pacific Coast News.

SAN FRANCISCO, July 30, 1900.—The harvest is now in this State practically at an end, and the results summed up, while they are not quite so roseate as at first appeared, are sufficiently so to give cause for general congratulation on the part of farmers, orchardists, merchants, manufacturers and the industrial classes in general. Our foundries and workshops, especially in the iron and steel industry, are about as active as they well could be, while as to labor troubles we have practically none, the few demands for higher wages in all except one case, that at Keswick, being promptly acceded to. And the Keswick work will come to San Francisco in all probability. This circumstance of advancing wages practically on demand of the workers shows that our foundrymen must be prosperous. Some institutions have orders ahead for another year, and the demand, both home and foreign, is likely to increase. One firm shipped eight gas engines to Australia and New Zealand by the last Australian steamer. The Hawaiian demand for machinery, pipe, &c., seems to be steadily on the increase. The troubles in the Orient would, it was predicted, lessen shipments thither, but it has not as yet, and unless the troubles should end in the Chinese driving foreigners out of the treaty ports probably will not. From other sources our sales and those of the principal Pacific ports are likely to increase largely. It has been stated on good authority that the Government will spend not less than \$20,000,000 in this city in the next few months. This will stimulate everything, and the business in hardware and metals, as well as all else. The only trouble that threatens is a lack of tonnage. Frequently of late we have not had a single disengaged ocean carrier in port, and the Government, in its search for transports, has already dealt us a blow in taking the magnificent 10,000-ton steamship "California," that was to have been placed in the San Francisco, New York and Hawaiian trade.

The development of the latter trade for the past six months has surpassed itself. The exact figures of the trade, the last two weeks of July being estimated, reach \$6,250,000. Of this exports of hardware, metals, &c., have been as follows:

Agricultural implements.....	\$6,654
Bicycles .....	32,385
Instruments, scientific, &c.....	66,002
Pig iron, 54 tons.....	1,732
Bar iron, 1,076,840 pounds.....	28,469
Steel rails, 698 tons.....	25,272
Steel sheets and plates, 706,734 pounds.....	23,264
Wire, 3,700 pounds.....	132
Castings .....	337,307
Cutlery .....	2,043
Firearms .....	3,840
Locks .....	757
Saws .....	3,497
Tools .....	24,611
Cash registers.....	206
Printing presses.....	2,917
Pumps and pumping machinery.....	135,968
Sewing machines.....	23,805
Boilers and parts.....	73,646
Typewriters .....	3,421
Machinery .....	1,061,589
Nails, 5,504 kegs.....	18,073
Pipe .....	257,510
Safes, 57.....	8,436
Scales .....	3,280
Stoves .....	12,494
Hardware, various.....	139,027
Plated ware.....	1,056
Tin, manufactures of.....	2,003
Total.....	\$2,296,396

Besides there were foreign exports—machinery, \$74,773, and hardware, \$8235, making in all, in round numbers, \$2,400,000. Should the rest of the year turn out as well, and there is no reason why it should not, the total exports for 1900 would be \$5,000,000, something that a few years ago no one hereabouts would have dreamed of. All this is owing to the great development of the sugar industry in the islands, and we are but at the threshold of this trade, for every planter and every sugar company in the islands is becoming aware of the fact that they need artificial irrigation and new machinery in order to keep up with those who have already availed themselves of these facilities, and for this reason I look for an expansion in this trade. I am sorry to say that there is, except in a few articles, no such production locally as these figures show. Most of the articles noted are obtained from the East by the local shippers, and a

very large portion of the trade, how much at this present writing I am unable to tell, simply comes in transit from the East, and is reshipped to Honolulu and other ports. In the case of machinery, there is no doubt that San Francisco does its full share of business, and also in some other directions, such as sheet iron pipe, boilers, &c. But it is not represented as it ought to be. In this and in other cases it is cheaper to ship the goods from the original source of production to San Francisco and then by sea to other destination than it is to get them here and then reship them, so that the only way that this city can secure its proper share of this trade is to have the articles in question manufactured in this territory. Of course, except where articles are needed in large quantity, there ought to be a fighting chance for San Francisco merchants who import the goods from the East, on account of the large assortment of goods carried constantly in stock by them, and the fact that they buy at the lowest possible prices. It is, however, with all drawbacks, a source of satisfaction to every well wisher of San Francisco's trade that we should, in the first half of 1900, export from this port as much articles in this line as we exported to every destination for the same time last year. In some lines the increase has been fully 30 per cent.

There is a great future in trade opening up before San Francisco, and this Chinese disturbance, unless it should enter on a very acute stage, is likely to give a great impetus to it. Even then in the end it will benefit this city, for it will draw attention to its facilities for communication with the Orient all over the world, and will bring Eastern and foreign men of enterprise here. There is a revolution in trade with the Orient pending, as well as a revolution in Oriental politics. San Franciscans are beginning to open their eyes to the possibilities of the situation, and are looking about for co-operation in the matter. Transportation is a vital point to them, and if they are handicapped in one direction by arbitrary action wherein the actualities of sea competition are disregarded, they will quickly find another. But the outcome will be a revolution.

J. O. L.

### Wm. Cramp & Sons' Annual Report.

The annual report of the Wm. Cramp & Sons Ship & Engine Building Company has been issued, and makes the following showing as compared with the previous year:

	1899-1900.	1898-1899.
Gross earnings.....	\$7,791,560	\$5,300,000
Operating expenses.....	6,878,560	(?)
Net profits.....	\$913,000	(?)
Fixed and other charges.....	376,738	(?)
Balance .....	\$536,262	\$331,250
Dividends (5 per cent.) .....	242,400	(2½) 121,200
Surplus .....	\$293,862	\$210,050

From the above it will be seen that dividends were increased from 2½ to 5 per cent., yet the surplus rose to \$293,862 from \$210,050 the previous year. The surplus of assets over liabilities is stated as \$1,848,044. The contracts on hand aggregate \$20,341,000, of which \$12,212,000 represents the amount unfinished. The work in hand or on the books includes, with other vessels, the following steamships:

	Gross tons.
New York & Cuba Mail Steamship Company (Ward Line), two, each.....	4,500
New York & Cuba, "Morro Castle".....	8,000
International Navigation Company, two, each.....	12,000
Oceanic Steamship Company, three, each.....	6,500
Wm. P. Clyde & Co., two, average.....	3,250
United States battle ships "Alabama" and "Maine," Russian battle ships "Retvizan" and "Varlag."	

Several of the above are about completed.

The president in his report says:

The growth of your business imperatively requiring enlargement of plant, a property owned by the Lehigh Valley Railroad Company, contiguous to the shipyard on the south and southwest, and containing 11½ acres, was purchased in your interest. On this property a machine shop is in course of erection, 332 feet long and 140 feet wide, containing about 85,000 square feet of floor space, and equipped with the most modern and improved machinery. A power house is also building which, when completed, will be the most perfect of its kind, being practically fire proof and built with a view to economy in distributing the power to the various shops. Two new slips and three piers have been completed on the river front of this property, and on the slips are building the two ships for the International Navigation Company, now under contract. Between these slips a large gantry crane is in process of erection. When these improvements are completed the extent and arrangement of your plant will not be equalled by any on this continent and by few in the world, and the economy of manufacture will be greatly increased. In addition to the above, the



shipyard formerly operated by the Charles Hillman Ship & Engine Building Company was acquired in your interest. Title will be taken in the name of the Kensington Shipyard Company, who will operate the yard, but all of the shares of the capital stock will be owned by your company. This yard adjoins on the north your basin, dry dock and marine railway, and its operation in connection therewith will afford an urgently needed increase of facilities for repair work.

### The Roebling Exhibit at Paris.

Among the conspicuous exhibits at the Paris Exposition, in the gallery of the American section of the Mines and Mining Building, is that of the John A. Roebling's Sons Company of Trenton, N. J. It occupies a space 3 feet 8 inches wide and 28 feet long. The most conspicuous feature is a model of the Brooklyn Bridge, for which the company furnished the wire and which was built from the designs of John A. Roebling and was erected under the supervision of himself and of his son, Washington Roebling. The installation of this part of the display was delayed through the loss of the "Paullac," a copy of the model being forwarded later. It reproduces in detail, to scale, the characteristics of the famous bridge, from anchorage to anchorage, as shown



THE EXHIBIT OF THE JOHN A. ROEBLING'S SONS COMPANY AT THE PARIS EXPOSITION.

in the accompanying engraving of the display, photographed before it was forwarded.

Two fine mahogany cases with large plate glass doors form the foundations for the anchor towers. The bridge towers rest upon eight superposed coils of wire rope, tapering from  $1\frac{1}{4}$  inch wire to  $\frac{1}{4}$  inch. The bridge being thus in the air, above the cases and coils, there is ample room below for the display of the company's products. The bridge is made of silver plated strips and wire ropes. It is a striking feature and finishes off the exhibit in a most novel and interesting manner. Its history is almost romantic. The original bridge was shipped from the United States on the lost steamer "Paullac." The company waited impatiently for news, but as they considered the bridge as a necessary feature of their exhibit, it did not remain quiet. Even before doubt had deepened into conviction regarding the fate of the "Paullac," a new bridge had been ordered at the factory, and on June 10 it stood erected in place before many other exhibits were in complete order.

The cases are filled with wire and wire cables of all dimensions in steel and copper. A spool of steel wire 1-1000 inch in diameter is shown. Between the pile of wire rope coils and underneath the main span of the bridge a show board has been provided, surrounded by an artistic iron frame. It holds a large picture of the works on one side and specimens of cables, &c., on the other.

The International Correspondence Schools of Scranton, Pa., have solicited and contracted with Thos. D. West of Sharpsville, Pa., to write a series of instruction papers for them on the principles involved in green sand, dry and loam work molding, also on mixing irons by analyses and the management of cupolas. The work is now more than half completed, and the papers will probably be ready for distribution by the school this coming fall.

### The Throw of a Crank—What Is It?

We received recently a communication from a manufacturer of crank shaft engine forgings inquiring as to the exact meaning of the word "throw" as applied to crank shafts. In compiling their table of dimensions they used the word as designating the diameter of the circle described by a revolution of the axis of the wrist pin, but they add, "recently some question has arisen as to the correctness of this use of the word."

We find that the dictionaries are of one opinion. Webster states under the word "Throw:" "The extreme movement of a slide valve; also of a crank or eccentric measured on a straight line passing through the center of motion."

The Standard says: "The travel or extent of reciprocating motion obtainable, as from a crank, eccentric or rock shaft; as, the crank has a throw of 6 inches."

The Century defines the word as follows: "In steam engines, the extreme movement of the slide valve or of a crank or of an eccentric measured on a straight line passing through the center of motion."

But Knight's "Mechanics" says that the word signifies "the radial reach of a crank, eccentric or cam."

Forney's "Catechism of the Locomotive" acknowledges a difference of opinion as to the strict meaning of the word and says: "There is some ambiguity in the use

of the term 'throw.' In Webster's Dictionary it is defined as the extreme movement of a slide valve; also of a crank or eccentric measured on a straight line passing through the center of motion. The definition of the mechanical terms in the edition of the dictionary quoted from was prepared by the late Alexander H. Holley, so that no more eminent authority could be quoted for the use of the term with this meaning. Nevertheless, the word 'throw' is sometimes used to designate the distance from the center of a shaft to the center of a crank pin or eccentric, which, of course, would be only one-half the extreme movement of a valve or piston."

The dictionary makers are well agreed concerning the proper meaning, but do those who make and use cranks think of the "throw" as a radius or diameter of the movement?

**The Talbot Process in England.**—The *Iron and Coal Trades Review* reports that a company have now been formed to take over the Talbot open hearth continuous steel process, and the prospectus will be issued shortly. The company will have a capital of £300,000, and will be styled the Talbot Continuous Steel Process, Limited. Arrangements have already been made with several English steel makers for introducing the process, and the necessary plant is already in some cases being put down. Other firms are negotiating for licenses, the benefits of all of which arrangements will accrue to the company. The vender, who is the promoter, has fixed the purchase consideration for the whole of the patents at the price of £225,000, payable as to £125,000 in cash, and as to £100,000 in fully paid shares of the company, thus leaving £75,000 for the provision of working capital, which the directors are advised is ample.

Report has it that the American Radiator Company are to build a branch works in Germany.

## The National Tube Company.

### The First Annual Report.

The Board of Directors of the National Tube Company have issued the following first annual report, for the fiscal year ending June 30, 1900:

#### Share Capital.

The amount of the capital stock issued and outstanding is:

Common stock.....\$40,000,000  
Preferred stock..... 40,000,000

Of this there is held in the treasury department for the benefit of the corporation:

37 shares preferred stock.  
1396 shares common stock.

#### The Properties and Freedom from Lien.

The properties owned by the National Tube Company may be briefly described as follows:

Location.	Acres of ground.	Plant.
McKeesport and Pittsburgh, Pa. ....	.90	National Tube Works, comprising— National Pipe Department. Boston Iron & Steel Works. National Rolling Mills. Monongahela Furnaces. Monongahela Steel Works. Republic Iron Works. U. S. Seamless Tube Works. McKeesport Connecting Railroad. National Transportation Company.
Cohoes, N. Y. ....	1½	Cohoes Tube Works—Bedstead pipe and other tubular specialties.
Versailles, Pa. ....	10½	National Galvanizing Works—Galvanizing, kalamelining, tinning and other anti-corrosive treatments.
Syracuse, N. Y. ....	3	Syracuse Tube Company—Special high grade locomotive and marine boiler tubes.
Pittsburgh, Pa. ....	15	Pennsylvania Tube Works—Lap and Butt Weld Pipe Works, manufacturing gas, water and oil line pipe and other tubular specialties, in sizes ½ to 28 inches inclusive, both black and galvanized.
Warren, Ohio. ....	30.92	Ohio Tube Company—Pipe plant for black and galvanized merchant pipe.
Philadelphia, Pa. ....	4½	Allison's Mfg. Company's Boiler Tube Works.
New Castle, Del. ....	.66	Morris, Tasker & Co. and Delaware Iron Works—Electric light, telephone and telegraph conduits, poles and other tubular specialties.
Chester, Pa. ....	15.4	Chester Pipe & Tube Company's oil well tubing, casing and line pipe works and lease of Tidewater Rolling Mill.
Oil City, Pa. ....	10.2	Oil City Tube Works' oil well tubing, casing, line and merchant, black and galvanized pipe plant.
Youngstown, Ohio. ....	10.94	American Tube & Iron Company's lap weld pipe and tube plant for regular and special long lengths.
Middletown, Pa. ....	12.23	American Tube & Iron Company's pipe, tube and galvanizing plant.
Pittsburgh, Pa. ....	14.25	Oil Well Supply Company's Elba Iron Works' rolling mills. Oil Well Supply Company's Continental Tube Works.
Wheeling, W. Va. } Benwood, W. Va. } Steubenville, O. }	.68	Riverside Iron Works, bar and guide mills—blast furnaces, steel works, skelp mills, galvanizing works, nail factories, tube works, coke plant and coal properties. The coal properties owned are located as follows: Steubenville, Ohio, 77 acres; Wheeling, W. Va., 200 acres; Benwood, W. Va., 328 acres; Fayette County, Pa., 996 acres. This latter tract is a part of the Connellsville coking coal. Total, 1601 acres.
Pittsburgh, Pa. ....	4	Pittsburgh Tube Works' pipe plant.

The company manufacture a range of sizes of tubular goods 1-16 to 36 inches, employing three distinct processes—viz., butt welding, lap welding, solid drawing—seamless.

The principal purposes for which these goods are used are:

Steam heating, plumbing and gas fitting; water, gas electric and compressed air conduits; air cylinders; water tubes and boiler tubes for steam generation; water grates, grate bars, hand rails, hollow piles and structural material; hollow axles; square, rectangular and other special shapes for agricultural purposes; trolley and electric light poles; hollow shafting; artesian pipe; tubing and casing; drive pipe; tubing and casing for oil production and transportation; subway pipe; galvanizing, kalamelining and tinning.

Aside from sizes, styles and qualities of the tubular goods required for the production and utilization of light, heat and water, the company also manufacture many specialties, such as shrapnel cases, projectile forgings and other forms of war material.

About four-tenths of the material which is finished and shipped in tubular form is manufactured by the company direct from the ore, such process entailing the

smelting of the ore into pig iron, the conversion of the pig iron into steel, the blooming of the steel into billets, the rolling of the billets into strips, from which tubular goods are directly made.

The company manufacture directly from pig metal and scrap a large portion of their iron products in their rolling mills, the capacity of which is not only sufficient to utilize all of the steel made from the ore, but enough to furnish a large portion of their iron strips, including an extensive forge and iron bloomery in which is made all grades to the highest of charcoal iron for locomotive boilers, &c.

The company have no outstanding bonds and no mortgages or liens of any description upon any of their properties.

#### Dividends.

During the past year, and at regular quarterly periods, dividends at the rate of 7 per cent. (\$2,800,000) were distributed to the preferred stockholders from the current earnings.

On May 15 a quarterly dividend of 1½ per cent. was declared on the common stock, payable August 15, the sum of \$2,400,000 (equal to 6 per cent. of the common stock) being segregated from the earnings of the last year as a provision for distribution to common stockholders in quarterly payments during the present fiscal year, as dividends may be declared.

#### Special Working Capital Investment Account.

The amount of \$2,908,119.20 from current earnings was applied to the purchase of investment bonds of a par value of \$2,800,000. These bonds are all of the first class and yield a yearly income of \$87,250. They are taken at par only, the premium (\$108,119.20) having been charged off to profit and loss and not added to the investment value.

#### Condition of Plants and Depreciation Account.

During the last year a large amount was expended for the maintenance and improvement of the properties, which has been charged to the cost of manufacture. Although we believe that our buildings and machinery have been kept up to the highest possible standard of efficiency, there has been reserved for depreciation the further sum of \$500,000.

To provide for possible loss in the collection of outstanding accounts the sum of \$175,000 has been specially set aside.

All the properties are fully insured.

The net profits for the fiscal year, after deducting expenses, depreciation and reserve, were \$13,878,364.69.

The number of stockholders has more than doubled.

The report of the treasurer and the audit of the chartered accountants, Jones, Caesar & Co., are as follows:

The accounting is now complete. All mill departments and sales agency books have been properly closed and new balances extended. The figures in every instance have been examined and their correctness affirmed by chartered accountants, and their certification accompanies the statement.

The new balance sheet and a statement of the general profit and loss account of all the properties, as proved and certified to, are as follows:

#### Balance Sheet, June 30, 1900.

LIABILITIES.	
Capital stock:	
Preferred .....	\$40,000,000
Common .....	40,000,000
Accounts payable.....	\$80,000,000.00
National Tube Works Company....	1,158,436.42
Reserve for depreciation.....	1,496,668.74
Reserve for dividends on common stock for year ending June 30, 1900 .....	500,000.00
Surplus:	
Profits for year per profit and loss account .....	2,400,000.00
Less:	
Dividends on preferred stock.....	13,878,364.69
Reserve for dividends on common stock out of profits for year to date..	\$2,800,000.00
Total.....	5,200,000.00
	8,678,364.69
	\$94,233,469.8
ASSETS.	
Real estate, buildings, plant, machinery and other permanent investments.....	\$72,953,937.5
Bills receivable.....	1,255,411.4
Accounts receivable.....	5,075,012.5
Merchandise, materials and supplies.....	5,801,690.7
Prepayments on ore contracts.....	768,612.3
Miscellaneous investments.....	225,078.5
U. S. Government, State, municipal and railroad bonds (cost \$2,908,119.20) at par.....	2,800,000.0
Cash .....	5,353,727.7
Total.....	\$94,233,469.8



**Profit and Loss Account.**

FOR THE YEAR ENDING JUNE 30, 1900.

Profits of the manufacturing and commercial business, including profits derived from operation of National Tube Works Company, after deducting all expenses.....	\$14,047,115.87	
Dividends and interest.....	614,368.02	
	\$14,661,483.89	
Reserve for depreciation of buildings, plant and machinery.....	\$500,000.00	
Reserve for possible loss in collection of outstanding accounts....	175,000.00	
Premiums on bonds purchased.....	108,119.20	783,119.20
Net profits for the year.....		\$13,878,364.69
Dividends on preferred stock.....	\$2,800,000.00	
Reserve for dividends on common stock for the year at the rate of 6 per cent. per annum.....	2,400,000.00	5,200,000.00
Surplus after providing for dividends per balance sheet.....		\$8,678,364.69

The items on the balance sheet may be commented upon briefly as follows:

**Of the Liabilities.**

Accounts payable represent accounts in process of audit June 30, 1900, practically all of which have since been paid.

The liability to the National Tube Works Company appears in full as an asset on the books of that corporation, and as this company are the owners of the capital stock of the National Tube Works Company it is in reality a contra account.

Expenditures for alterations and improvements at the various mill departments were charged into the cost of goods and so absorbed. The sum of \$500,000, set aside for reserve for depreciation, is in addition to all such expenditures, and is a special appropriation against which no commitments have been made.

The reserve for dividends on common stock—\$2,400,000—is self explanatory, and is in cash on deposit in banks.

**Of the Assets.**

Bills receivable and accounts receivable are all good as far as known. The item of \$5,075,012.33 is the net amount after allowing \$175,000 to cover any possible shrinkage in the collection of the accounts.

The inventory appraisals of merchandise, materials and supplies were made under the instructions of the first vice-president and upon valuations furnished by him. They were thought to be conservative, in most cases being taken at less than cost, and were based upon price levels lower than current.

Prepayments on ore contracts cover the cost of the greater part of our ore supplies to December, 1900, and were made in order to obtain the cash discount allowed on such prepayments.

Miscellaneous investments cover sums invested in corporations handling in part the material and products of this company.

During the fiscal year as the cash on hand of the corporation was found to be in excess of their mercantile needs, investments in securities were authorized to the par value amount of \$2,800,000. The bonds purchased cost \$2,908,119.20, of which sum the entire premium has been charged out of the profits of the year. The securities forming this asset are herewith given in detail:

**Detailed Statement.**

BOND INVESTMENT ACCOUNT.				
Par.	Name.	Rate.	Due.	
\$100,000	State of Massachusetts, registered .....	3½	1928	
100,000	Baltimore & Ohio Railroad Company, prior lien .....	3½	1925	
100,000	City of Pittsburgh, Pa. ....	3½	1915	
100,000	City of Pittsburgh, Pa. ....	3½	1921	
100,000	Illinois Central Railroad, Louisville Div. ....	3½	1953	First mortgage.
100,000	Illinois Central Railroad, St. Louis Div. ....	3½	1951	First mortgage.
100,000	Southern Railway Company .....	5	1994	First cons. mtg.
100,000	Chicago, Burlington & Quincy Railroad Company .....	3½	1949	Illinois Div. Mtg.
100,000	Elgin, Joliet & Eastern Railway Company....	5	1941	First mortgage.
50,000	Union Pacific Railroad .....	4	1941	First mortgage.
50,000	Cleveland & Pittsburgh Railroad Company..	3½	1948	General mortgage, principal and interest guaranteed by Pennsylvania Railroad Comp'y.
100,000	City of Providence, R. I. water loan.....	3	1930	
100,000	Northern Pacific Railway Company, prior lien .....	4	1997	
100,000	United States 2 per cent. Consols.....		1930	
0.000				

It will be seen that the current assets of the company amount to \$21,279,532.50, and the current liabilities, including the reserve for dividends on common stock, amount to \$3,558,436.43, leaving an excess of current assets over current liabilities of \$17,721,096.07. It is of interest to state that the books of the National Tube Works Company—which corporation, as stated, are owned by this company—show current assets of \$5,203,938.86 and liabilities of \$810,410.02, leaving as the net current assets of that corporation \$4,393,528.84. The net current assets therefore of the combined companies were \$22,114,624.87.

All purchases of material, supplies, &c., are paid for in cash and every possible advantage taken of discounts for such settlements. The company are entirely free of indebtedness of every nature other than that for current accounts, as shown in the balance and previously referred to.

The Colonial Trust Company of New York have registered all certificates of stock issued and all canceled. For all certificates issued duly assigned certificates covering an equal amount of capital stock have been surrendered and invalidated. The transfer department has been conducted under the immediate supervision of our general counsel. Respectfully submitted,

A. F. LUKE, Treasurer.

**In General**

During the first six months of the period covered by this report the demand for wrought tubular goods continued very active, with the highest range of prices known for ten years. The following six months, covering the last half of this period, showed a decrease, both in demand and prices; but this statement is probably applicable to all other industrial forms of business.

While we are curtailing our manufacturing operations somewhat at the present time, the stocks of our line of goods in the hands of jobbers and large consumers are very light, and we see no present reason why the demand for our goods during this second fiscal year should not be sufficient to operate our leading works.

Believing that the financial success of our company depends largely upon economy of operation, the attention of our manufacturing department has been steadily directed to the perfecting of the efficiency and the enlargement of the capacity of our best manufacturing properties and the concentration of the manufacture at the best equipped and located plants.

Our exports have been the largest in the history of the corporations whose properties have been acquired by this company, notwithstanding that the war with South Africa has considerably curtailed one of our most important fields. Special attention is still being given to the further extension of our foreign department.

New specialties are being developed and new outlets are being found, with a view of so broadening our markets as to counterbalance the effect of temporary local depressions in trade.

While competition is and has been active, there have not been more installations of new competitive machinery than has marked all of the past eras of great activity in the iron and steel business.

The work of systematizing such a large aggregation of separate corporations and firms, with a view of concentration and economies of manufacture and distribution, has been very great; and while many of our expectations in this direction have been fully realized, we have every reason to believe that the coming year will show even better results in that direction.

For the Board of Directors,

EDMUND C. CONVERSE, President.

**The Sharon Steel Company.**—The Sharon Steel Company are pushing operations at their ore mines at the new town of Sharon, Minn. James P. Whitla, of Sharon, Pa., will be the manager of the ore interests of the steel company in Minnesota. The Minnesota Sharon is situated 9 miles east of Hibbing, Minn., and three weeks ago there was not even a tree cut down. To-day, however, there is a three-story hotel, a large number of houses, five saloons and several business buildings. The town has been plotted only two months, and it seems as if property will move off in true Western boom style. The firm of Drake & Stratton are just beginning on 400,000 cubic yards of stripping and several camps are established at the new town. A railway is being pushed in to the new mines. The amount of ore in sight is large, and the Sharon Steel Company will within a year be in shape to consume all the ore which the mines can turn out. John Mewhinney, formerly superintendent of the Williams mine at Biwabik, is superintending the work at the new town. Meanwhile the work of construction at South Sharon, Pa., on the large mill and furnaces of the steel company goes on steadily, sometimes being carried on by electric light at night.

## Industrial Depressions and the Pig Iron Reserve.\*

BY GEORGE H. HULL.

The first requisite for a successful study of this subject is a clear appreciation of the difference between industrial depressions and financial panics. The former result from an abnormal advance in the price of the great staples of the country, principally those used in the building of houses, railroads and such other works as are usually classed under the head of permanent improvements. When these staples advance in price as much as 80 to 100 per cent. above their normal market value a large percentage of the building enterprises of the country are stopped. This throws a vast army of workers out of employment and causes a heavy decline in the market value of all materials used in these improvements. If this decline in value be equal to the preceding advance it results in such enormous losses that a financial panic is the almost certain result.

In brief, industrial depressions are the effects of great advances in prices; financial panics are the effects of great falls in prices.

A financial panic is an acute mental malady. Its beginning is sudden, intense and startling. Its chief element is fright. It paralyzes finances at a single blow, each subsequent step in its course being an alleviation. From its nature it is short lived.

An industrial depression is a stubborn physical malady. Its beginning is so gradual and quiet that it may go on increasing for months unnoticed. From its nature it is long lived. It begins when everything is at the height of prosperity. Let me give a local and recent illustration.

In the little community in which I reside there were 23 houses built in 1899, all of which were contracted for before the advance in prices. This kept the workers employed all the year. A large number of residences were planned for 1900, but when the bids for these came in it was found that a residence which would have cost \$100,000 in 1899 would cost \$160,000 in 1900. The result has been that as bids have come in the projected buildings have been given up; and, as the houses contracted for at low prices have been completed, the workmen have departed. If this be an isolated instance and these workmen are finding employment elsewhere, then it signifies little. But if this be typical of what has been taking place throughout the country, and they are not finding other employment, then we have already made several months' progress toward industrial depression.

It is estimated that in the United States there were 28,000,000 of persons engaged in some gainful occupation in 1899. The discharge of five out of each 28 would hardly be noticed in any community, large or small, and yet, as soon as this takes place in each community it amounts to a reduction of \$3,000,000 per annum in the buying power of the nation. This is not all. Fewer working hours and reduced wages must be accepted by those still at work. This takes other thousands of millions per annum from the buying power of the nation. No other suggested cause of industrial depressions compares with this in amount, or in its blighting effect upon the industries of a people.

The conditions of industrial depression are, first, discharge of workers, and just in proportion as this takes place the earnings of the people are reduced. This, in turn, cuts down expenditures and lessens demand. As demand falls off, production is cut down and more workers are discharged. Thus the five elements of depression—reduction of employment, of earnings, of expenditures, of demand and of production—form an endless chain, each acting directly upon and diminishing the other, each feeding upon and intensifying the other.

For the solution of this question the United States Congress appointed three commissions between 1882 and 1886. Like commissions have, in recent years, been appointed by Great Britain, France, Germany, Italy, Canada and Belgium. Thousands of witnesses testified before these commissions. Their opinions fill volumes, and have been classified under 180 different heads. Opinions are the most unreliable of all testimony. They are as varied as the countenances of the people who advance them. The prevailing opinion is often on one side of a question in one country and on directly the opposite side in another. Is it surprising, then, that the substance of all these government reports is that the cause of industrial depressions is still an unsolved mystery?

The United States Commissioner of Labor, in his first annual report of industrial depressions, issued in 1886, gives some data, from analysis of the information gathered, which are of great value. First in importance is the conclusion that industrial depressions were most severe in Great Britain, United States, Germany, France

and Belgium, and were not felt to any material extent in other nations. Second, that the degree of severity in these five nations as related to each other was in the order named—that is, most severe in Great Britain and so on. Third, that industrial depressions were nearly or quite contemporaneous in these five nations. The following paragraph and table is taken from page 290 of said report:

"It has been clearly shown that the depressions of the past in the manufacturing nations of the world have been nearly or quite contemporaneous in their occurrence. Summarized as to dates, the following table is deduced:"

Countries.	Years of depressions.												
United States ...			1814	1818	1826	...	1837	1847	1857	1867	1873	1882	
Great Britain....	1803	1810	1815	1818	1826	1830	1837	1847	1857	1866	1873	1881	
France .....	1804	1810	1813	1818	1826	1830	1837	1847	1856	1866	1873	1882	
Belgium.....							1837	1848	1855	1864	1873	1882	
Germany.....							1837	1847	1855	...	1873	1882	

In seeking the cause of industrial depressions, therefore, we may clear the field of a large amount of rubbish by summarily dismissing from the investigation, as untenable, all alleged causes which are purely local in a national sense, such as presidential elections, changes in tariff, demonetization of silver, national banking system, &c.

We must look for the real cause in some condition which was common to the five nations and which did not exist in the other nations, or in something which took place in the five nations contemporaneously and did not take place in the other nations. We must find, also, some cause which placed the five nations in the order they occupied as to relative severity of industrial depressions, and, finally, some cause which grouped little Belgium with the larger nations, Great Britain, United States, Germany and France, while Russia, Austria, Italy and Spain were grouped with the smaller nations.

In the following table, which gives the iron production, will be found conditions which meet in every particular the requirements just defined. The record of production in 1882 and 1886 is given, because that was the period covered by the various government investigations which discovered the relative severity of past panics.

### Production of Iron in the Leading Industrial Countries.

	1882.	1886.
	Tons.	Tons.
Great Britain.....	8,586,680	7,000,734
United States .....	4,623,323	5,089,230
Germany and Luxemburg.....	3,380,805	3,528,677
France.....	2,039,067	1,516,371
Belgium.....	736,946	701,677

On the other hand, a careful search through the 800 pages of Mulhall's "Dictionary of Statistics" fails to reveal any matter connected with finance, agriculture, manufacture, earnings, expenditures or trade which answers these requirements. There is, in fact, no matter aside from iron production which even places the five countries in one group, to say nothing of placing them in the order they occupy as to severity of industrial depressions.

Before iron became of preponderating importance to the industries of nations there were no industrial depressions except those born of causes apparent at the time, such as pestilence, famine and war. The condition of industries in the United States up to 1814 was one of uninterrupted prosperity. France and Great Britain, which then furnished the world's iron supply, experienced two seasons of industrial depression during this period. The United States was the next country to produce sufficient iron to give it importance in the economics of the nation. Later on Germany and Belgium became large producers, and just in this order they commenced to experience industrial depressions.

Iron is a powerful instrument for good when under control, and just as powerful an instrument for harm when not under control. It is not under control when it advances in price 80 to 100 per cent. above its normal cost.

A careful review of the authoritative publications upon the subject reveals the fact that the conditions of seven periods of abnormal advances in iron were identical in their train of events, and the advance of 1899 is no exception to the rule. First, there was a revival of industries, such as occurred in 1897 and 1898, during which the employment of workers was gradually but very greatly increased. This brought about a corresponding increase of earnings, amounting to thousands of millions. The earnings being largely in excess of the production, these surplus earnings were used, first, in a more generous indulgence in the comforts and luxuries of life, then in investments in existing wealth, particularly that represented by bonds, stocks and certificates, because these are more easily transferred. This advanced securities to

\*Condensed from the *Engineering Magazine* for August.



something like their real value. Later, investments were made in permanent improvements, such as houses, factories, railways, &c. This last brought about a sudden and enormous advance in the price of pig iron, because the conditions surrounding its production made it impossible to increase the supply rapidly enough to meet the demand. All the other staples could easily have been provided in quantities sufficient to have met the demand without abnormal advances in their price, because increased supplies are quickly available. Thus, of lumber, two or three years' stock is always carried, and brick, stone and coal can always be adequately and quickly supplied by simply increasing the workers in brick yards, stone quarries and coal mines. But of iron we have carried for the last ten years less than 23 days' production, and it takes a year to build a furnace. Consequently, in each period of revival in the industries of the world, iron consumers became alarmed through fear that there would not be enough to supply all demands; each buyer made an effort to contract for sufficient to supply his needs, and, this being impossible to accomplish, prices advanced rapidly until they reached 80 to 100 per cent. above cost. These advances in iron invariably occurred before there was any material advance in the prices of the other staples. If the other staples were subject to the same conditions which control iron they would have advanced when it did. When the advances in the other staples came it was not from necessity, but simply because the advance in iron gave the holders of other staples excuse and opportunity. If the advance in iron had not exceeded 10 or 15 per cent. the advance in the other staples could not have been greater, and prosperity would not have been checked. In every period of depression, the check to all constructive enterprises came with the completion of works contracted for at normal figures. Iron was first in each period to show short supply, and the difficulty of procuring anything made of iron and steel existed throughout the entire period of the boom. When that difficulty ceased the boom ceased and the conditions of industrial depression began their silent and blighting work. Not from lack of money or confidence, but in the very height of plenty and business activity.

When panics result from and occur during seasons of great industrial depression, they get the reputation of being long-lived. But it is in reality the effect of the industrial depression which is long-lived. Panic effects pass away long before the recovery from the effects of industrial depressions. The industrial depressions of 1837 and 1857, both of which were attended by financial panics, continued no longer than the industrial depression of 1847, which was not attended by financial panic.

These violent and wholly unnecessary fluctuations in prices, which we call booms, disturb all business, but their greatest injury is to the pig iron producers. The building and reviving of furnaces is unduly stimulated. This results in disaster to many, and undue lowering of prices to all, on the reaction. The financially strong producers must accept prices which the weaker ones are forced to make; thus prices are carried abnormally low. Nearly the entire period covered by booms is occupied by the industrial world as a whole in filling low-priced contracts. By the advance in prices of labor and raw materials, many lose on contracts which, but for the advance, would have paid a profit. The boom is attended by high wages and frequent strikes for higher. The decline is attended by constant strikes to resist wage reductions which manufacturers must make to save themselves. Workers lose more by idle months than they gain by the temporarily advanced wages. The business world as a whole gets no benefit from booms. Stripped of all its disguises and illusions, a boom is simply a cruel and disastrous blow to the industrial world.

The only possible way to bring iron under proper control is to accumulate, in each of the iron producing countries of the world, a stock of pig iron equal to several months' production. It will not suffice to do this in one country only. The demand from the others would carry its price up with theirs. Each country must accumulate an adequate reserve stock of its own. If this be done during the next few years, there will be no more periods of boom and no more periods of industrial depression, except such short temporary interruptions as may come from financial panics; in time they, too, may be understood and prevented.

If the manufacturers of building materials would, at this juncture, voluntarily and promptly put down prices to within 10 per cent. of normal figures, which is as low, also, as they should ever have gone, even in periods of most marked depression, it would revive a large number of the building enterprises which are now postponed or abandoned, and a prolonged industrial depression might even at this late date be averted. If, on the other hand, prices are held up, until sales are forced by the accumulation of excessive stocks made at high cost, then heavy losses and failures will occur, confidence will be lost and a great amount of reduction will revive the postponed enterprises, until the iron producing nations have passed

through just such another industrial depression as has heretofore followed each abnormal advance in the price of iron.

The act which puts an end to seasons of industrial depression will inaugurate an era of unexampled prosperity to the iron producing nations of the world.

## The Clergue Enterprises at Sault Ste. Marie.

There is now under way at the eastern end of Lake Superior a development of industries that is one of the most interesting of any new installation now progressing on the American continent.

This development is based on two axiomatic propositions: 1, that the day of large and assured profits in competitive industries is declining and that such profits must be made from original processes, which processes will be to a certain extent monopolistic, using that word in its best sense; and, 2, that to be successful in the broadest way industrial development must utilize only such materials, ingredients and methods as being natural to the locality can be cheaply assembled at point of manufacture, and must utilize all of them, disregarding no by-product of commercial value that can without too great cost be made productive. These propositions, backed by skill, an enthusiasm and *esprit du corps* rarely excelled, ample capital and a directing mind of grasp and acumen, would seem a combination for results. This is, in brief, the situation as to the nine or ten associated companies located at the Sault Ste. Marie, Ont., that are now engaged in developing and utilizing the vast power of Lake Superior, under the leadership of Francis H. Clergue.

At present the product of these companies is limited to paper pulp, one of the largest mills in the world being steadily at work, and to iron ore from a mine just opened. But there are under construction what will be the largest chemical pulp mill in existence; works for the production from nickeliferous pyrrhotite of sulphurous and sulphuric acid, sulphite liquor and sulphurous anhydride; works for the reduction of the roasted clinder which is a by-product of this pyrrhotite into a nickel steel or a ferro-nickel alloy of value in the arts, and a large electrolytic plant for the production of caustic soda and bleaching powder is about going into operation. Works planned and to be erected as rapidly as possible include blast furnaces to treat hematite iron ore from the company's new Helen mines on the northeast coast of Lake Superior, and a rail mill to roll daily 1000 tons of nickel steel rails, &c. For the immediate present the power used amounts to about 20,000 horse-power, of which 14,000 are required by the mechanical pulp mill and the remainder for machine shops, alkali works, experiments, &c. But the company are constructing on the Michigan side of the Sault River a canal to furnish them 50,000 horse-power. Two weeks ago the first earth was turned for a third canal, to be on the Canadian side and to develop 40,000 horse-power. The total of these three canals will give this one company the enormous power of 110,000 horse-power, with Lake Superior for a mill pond, and they will utilize most, if not all, of the water now running to waste down the rapids of Ste. Marie.

The inception and growth of these industries so far, the new processes used and to be adopted in later works, and the personnel of the enterprise form a fascinating and absorbing story. The enterprise is the direct result of failure, for when disappointed in disposing of power from their original canal, built under the supposition that water power could be quickly and profitably sold to manufacturers, the company cast about for methods for utilizing the power they had harnessed, and every development made and making has been but a natural outgrowth and ramification from the first.

### A Pulp Mill Started.

When the company five years ago had completed their original 20,000 horse-power canal they were ready to sell power to manufacturers, but to their surprise no manufacturers seemed desirous of buying. The investment was too great to abandon, and the vast forests of spruce that cover Southern Algoma were a most natural and available resource. A pulp mill to turn out 100 tons a day of ground wood pulp was erected. Wood pulp was then shipped wet to the paper factory, and there was the added cost of freight on 55 per cent. of water and the loss by the staining of pulp by the decomposition of rosin in pulp fiber. These circumstances limited the market, and the paper makers of the great Wisconsin districts looked on and treated the Sault Ste. Marie mill as a valuable adjunct to them in the way of raw material, but as of no particular importance to its own stockholders. The company then invented and installed a drying attachment, and have since then reached a

position where they are a great factor in the price of paper pulp in the Western United States and in Canada. They are able and do ship to all parts of the world where paper is used. At present the product of this mill is worth about \$900,000 per year, and the cost of manufacture must be very light on account of the enormous and practically free supplies of spruce wood close by, and the cheap power and excellent water Lake Superior furnishes.

#### Sulphur for Chemical Pulp.

But chemical pulp, treated with sulphur, is worth nearly double mechanical or ground pulp, and the company decided to erect a 100-ton sulphite mill. There were no adequate sources of sulphur nearer than those that would cost, delivered at Sault Ste. Marie, from \$25 to \$35 a ton. A hundred miles east of the Sault there are the extensive copper and nickel deposits of Sudbury, which is the world's chief nickel producer. There the Canadian Copper Company were making a nickel matte and belching forth from furnaces vast volumes daily of sulphuric acid gas. The Canadian Copper Company were asked to come to the Sault, where the paper mill would be a consumer of this waste. But the company stated that they had investigated the question of saving the gas from pyrrhotite and had found it impracticable for them. Mr. Clergue's experts were of the contrary opinion, and investigation in original processes at his laboratory, it is claimed, proved them correct. They claim to be able to produce a commercial product from the roasting of pyrrhotite, a claim which those engaged in the chemical industries will need to have backed by convincing proof, on a working scale, before they accept it. Mr. Clergue then bought a nickel mine for the sulphur. To this mine and on to Georgian Bay his company are now building the Manitoulin & North Shore Railway, to develop their own and other nickel deposits of great extent. By a novel and original roasting process they claim to have been able to extract the last atom of sulphur from its ore, leaving a ferro-nickel ore. The construction of the sulphite pulp mill is now well advanced and it will this winter present many new processes in manufacture.

With the ferro-nickel ore left after the elimination of the sulphur the company had something of potential value, and in line with their laid down policy set about its utilization. Furnaces were devised that, to the extent of a 5-ton unit, smelted this soft, high nickel material with a sufficient mixture of anhydrous sesquioxide of iron to make a hard nickel steel by the use of electricity as the smelting agent. All tools that require hardness in the company's large and well equipped machine shops are actually manufactured there from nickel steel reduced from the ore in their own 5-ton experimental furnaces. The company consider it settled that they can produce this alloy in large quantities at low price and are now proceeding on this theory in the widening of their industrial operations. They are now preparing to erect furnaces to make 250 tons daily, which are stated by them to be under a contract to supply the Krupp works at Essen, Germany. As yet, however, none of this material has been delivered.

#### Iron Mining.

In the summer of 1897 a prospector searching for gold in the Michipicoton country, 125 miles north of the Sault, found an outcropping of hard hematite. He did not know its value or extent, had no funds with which to explore and offered his discovery to Mr. Clergue for \$500. An investigation proved satisfactory and the money was paid. This ore gave the necessary ingredient for reducing the surplus nickel of the alloy and opened a tempting field for the miner.

Eleven months ago there was sent from the Sault a scow loaded to the guards with men, tools, supplies, horses and a corps of civil engineers. Arriving in the perfectly land locked bay of Michipicoton, the supplies were unloaded in small boats, and the engineers and laborers spent the first day in cutting a hole in the forest large enough for their tents. Twelve miles to the northward, over as difficult a country as a mountain chain, lay the ore. There was no reconnaissance survey, no topographical plates, no guides of any nature. The next day the engineers began a survey to the mine and the laborers began the grade. July 12 this year the first cars of ore were hauled down over a line laid with 85-pound steel, upon a dock and into ships bought by the company in England a few weeks before. Half of the eleven months consumed in this undertaking were winter, with the nearest supply point 125 miles away over impassable fields of ice and wastes of water. Every article used in the construction and operation of road and dock, from 110-ton locomotives, 50-ton steel cars and 67-ton steam shovels, to saw mills, ore crushers and down the list of the innumerable necessities, had to be brought from civilization and landed in this wilder-

ness. Supplies not on the ground in November were not to be had at any cost till April. Neither men nor food could be obtained in the interim, except at great risk and high cost.

There is now completed a road of good alignment, with grades against traffic of under 1 per cent. and with traffic not exceeding 3 per cent., with a maximum curvature of 12 degrees, with a heavy equipment, sidings, &c., and with a quarry of hard hematite ore at the end of it that is estimated from diamond drill borings to contain many million tons. A dock of a style absolutely new, capable when fully completed of loading perhaps 10,000 tons a day, is sufficiently advanced to handle cargoes with reasonable dispatch, and the company's equipment of 200 50-ton pressed steel cars is arriving, via scow, as rapidly as possible.

This mine is a quarry of ore rising from a small lake to a height of perhaps 100 feet and extending back to the base of a cliff 600 feet. Tunnels have been driven into the cliff 250 feet further, at which point the capping of rock is encountered, dipping away from the ore at about 50 degrees. At the lake end the deposit dips under the water, and drill borings there have found ore 1000 feet from the further end of the tunnels and 125 feet below the water line. The width of the deposit is said to be from 500 to 800 feet, part of it being of a lower grade soft ore not sufficiently rich for long shipment. The average of shipments so far made to dock and by borings is about 62 per cent. iron, 0.04 to 0.05 phosphorus, and quite low in moisture. It is a specular hematite, somewhat porous and easily crushed, and experiments so far made in a small way have shown it easily smelted.

At the mine most of the deposit from the lake's edge to the base of the cliffs and for a part of the width has been stripped of the thin covering of vegetable mold and dirt, and is now bare to the eye. A No. 8 Gates crusher, capable of breaking a guaranteed amount of 5000 tons a day, has been installed and is working finely. The crusher can probably break much more than the specified tonnage. A system of overhead Lidgerwood conveyors has been contracted for, to deliver ore from the various pits to these crushers, and the latter deliver crushed ore to cars by gravity. Levels will be cut from the faces on which the ore will be mined. The small lake at the edge of the deposit lies 28 feet above another not a stone's throw distant, and this in turn is 120 feet above a third, another stone's cast away, so that the entire lake at the mine can be siphoned out with small expense. Diamond drills have penetrated the deposit at various points to the depth of 240 feet, at which depth the character of the ore is apparently not much changed.

This ore deposit is not, it would appear, an isolated outcropping, for the company have traced the ore bearing formation in the Huronian for 60 miles and have located several other ore bodies therein, none of which have been more than cursorily examined. One of these, 10 miles from the Helen mine, shows a deposit of fine hematite of unknown extent. It is the opinion of the company that a sixth great ore range of Lake Superior has here been found, and they are proceeding on this theory in their search for mineral and in locating their land grants.

#### A Vast Land Grant.

Within the past three weeks the Ontario Government has granted the company a princely area, 1,650,000 acres in fee, including all mineral and timber rights, and to be selected within reasonable distance of their roads. One hundred and fifty expert mineralogists, geologists and woodsmen, each party of two men assisted by two Indians and equipped completely, are now in the forests included in this grant of 71 townships, verifying and correcting previous information from all sources, locating bodies of timber and favorable mineral bearing lands, and tracing the contacts of the formations lying along the northeast coast of Lake Superior. Considering the mineral possibilities for not only iron, but copper, gold and other minerals, and noting that the timber of the region is very largely spruce, and that spruce is almost indispensable for paper making and is becoming scarce and high elsewhere, the possible future value of such a grant passes beyond the reach of the imagination.

The spruce on this grant grows to such a size that the company do not now, and do not expect in the future, to use for paper making logs of less than 6 inches diameter. This fact is of particular interest to paper makers of the United States. It is owing in part to this, in part also to the new processes for which the company are continually striving, that they are able to make a ton of wood pulp from a cord of wood.

With the discovery of this mine and the beginning of its development into an important property it was evident that mining operations more extensive than its use as a mixture for ferro-nickel would allow should be undertaken, and the blast furnace proposition was at-



tacked. Plans have been received from prominent engineers for furnaces of a capacity to furnish metal for a 1000-ton rail mill, and they are intended to be erected within the next year. Subsequently a rail mill, to roll rails of their nickel steel alloy, is, it is stated, to be added.

In connection with their blast furnace proposition the company have been experimenting along lines of startling interest, and if they are as successful in large practice as they believe they have been in small experiments will develop a process that is, to say the least, revolutionary. The plans for the ferro-nickel works propose 100 furnaces of a daily capacity of 5 tons each.

For the separation of the copper contained in the company's Sudbury ores processes were introduced necessitating the use of sodium in quantity, and by electrolysis at their alkali works they are decomposing salt into its constituents. The chlorine was a by-product, and to utilize this the company are proposing to manufacture bleaching liquor, using limewater instead of lime as the medium to carry the chlorine, and in that way getting a higher percentage of chlorine in the combination.

From their roasting plant the company expect to get sufficient sulphurous acid to far more than fill their own requirements, and will compress this into liquid sulphurous acid, which they will ship. They plan to supplant the use of imported sulphur in the sulphite mills of Canada at greatly reduced cost.

A subsidiary company in Michigan have recently closed contracts with the Union Carbide Company and the United Alkali Company to furnish these latter with 40,000 horse-power electrical energy on the American side of the Sault River. For this purpose and for their other industries present and prospective the company have need of immense water power. As has been stated, they have in operation on the Canadian side a canal furnishing some 20,000 horse-power. On the Michigan side the excavation was on July 30 about 55 per cent. completed for a very large canal, furnishing with an available head of about 17 feet some 50,000 horse-power. This canal is 2½ miles long and carries a stream 20 feet deep at a speed of 8 feet per second. It is cut for half its length in a solid ledge of sandstone, the waste material from which is used for the construction of the substantial and handsome buildings of the company on both sides of the river. The canal is employing a large force of men and machinery; compressed air is used to drive drills, channelers, &c., and in the rock sections these machines cut the sides of the permanent canal out of the solid ledge. The foundation of a magnificent power house, 1380 feet long, 100 feet wide and 106 feet high, is being laid and the building will go up rapidly. In this structure 320 turbines set in tandems of four will drive 80 single-phase dynamos. This work will probably be completed next year.

Besides these two canals work was begun in July on a third, to be on the Canadian side and to develop 40,000 horse-power. It will be similar in length to the Michigan canal. This work will be carried along slowly for a time and it will be several years before the canal is in operation.

These three canals will take a very large share of the flow of Lake Superior, leaving little or no water for the rapids. These are destined to become a mere rivulet, or a dry channel. Fear has been expressed by those whose interests were with the depth of water in the lock and ship channel, and who were not conversant with the necessities of the power company's situation, that this would lower the available depth in the ship canals. As a matter of fact, the company's entire investment rests on a constant and regular head, and they cannot afford to diminish the Lake Superior level. Every inch of fall means a heavy loss, and a large fall would simply cause a complete cessation of their electrolytic operations. This simple and sensible method of remedying any increase of flow through the water power canals would be by a system of submerged weirs, calculated to obstruct a flow equal to that going out by the canals, and this has been recommended by the company's engineer, Alfred Noble. But the Government is disposed to require a more costly and complicated method, that of the Stoney sluice, with steel shutters. There must therefore be built in the Sault River 18 heavy rock and concrete piers, connected by steel shutters, expensive to erect and costly to operate. The first of these will be begun this fall on the Canadian side of the river.

The company have erected at the Sault a fine laboratory in which they test free of charge any minerals brought to them from any part of the country near their operations. The laboratory is thoroughly equipped, and analysis by electrolysis in many minerals is regularly carried on. The chief metallurgist is E. A. Sjosledt, and Titus Ulke, late of the Anaconda Copper Company, is chief of a department for the company. As a part of the technical equipment is a library of current industrial

publications in all languages, covering lines in which they are interested, and numbering something less than 100, which on receipt are bound, repaged consecutively and completely indexed. Twelve chemists are employed in analyses and experimentation.

Finding it unsatisfactory to secure elsewhere the machinery and tools required for many of their processes, the company built a large machine shop, where they have erected all possible parts of their equipment. They have just completed and are now moving into an addition to this shop 100 x 180 feet and two stories high, equipped with new tools throughout from the best makers in America. There are ten lines of tools, each 180 feet long, driven by shafting from a central dynamo, the company considering this method better adapted to their purposes than separate motor driving. The entire shop employs about 250 men, and very little outside work is done there. A 50-foot traveling crane is provided, and a track of the company's railway, Algoma Central, runs through the building. A patent by one of their foremen is in use at all lathes by which metal is turned to a section of any desired shape.

The railway projects of the company are aided by the Ontario Government, and besides their land grant they have within the past month received cash subsidies from the Dominion Government of \$360,000. The Algoma Central has ten miles railed and ten more ready for steel, northerly from the Sault, and will reach a point 150 miles north next year. It is chartered and subsidized to Hudson Bay, 500 miles north, and by the very recent purchase of the charter of the Hudson Bay & Sault Ste. Marie road it comes into line for an additional land grant of 1,250,000 acres and \$500,000. This will be earned later.

"We shall be running through trains to Hudson Bay, and carrying fish to Chicago from there inside of five years," said Mr. Clergue, when speaking of this part of the enterprise.

The Sudbury line, named the Manitoulin & North Shore, which is likewise subsidized by the Government, is being railed for a considerable portion of its ultimate length of 75 miles through the nickel belts.

The various companies under the control of F. H. Clergue and his brothers, E. V. and B. J., have so far spent between \$4,000,000 and \$5,000,000, and their daily payroll is more than \$5000. The projects they have in hand will cost nearly \$20,000,000, and these funds are raised without an issue of bonds of any nature. The mechanical pulp mill is now earning at the rate of \$900,000 per year, and is fixing the price of wood pulp in the West, and the sulphite mill will be earning \$1,500,000 per year before winter. Rentals from leases of power already made at the Michigan Canal will amount to nearly \$500,000 a year, besides the portion of that power the company retain for their own use, which portion it is hoped to utilize for the extraction of silver from lake copper, and for the reduction of what ores of copper may be found in the region, &c.

In excavating for one of their buildings, Mr. Clergue opened into the original Hudson Bay Company ship lock, by which their trading boats of 150 years ago passed around the rapids. The very existence of this lock had been forgotten. The long buried work was at once rescued from decay, its walls were relaid in stone and filled with running water. Surrounded by a protecting rail, it is now an interesting commentary on the progress that has been made since one lock 40 feet long and 10 wide was ample for the commerce that to-day three, each from 600 to 1000 feet in length, and from 80 to 100 in width, are scarce able to accommodate. A short distance away was the Hudson Bay block house, the scene of numerous Indian forays and encounters, surrounded by a rotting and scarce discernible stockade of timber. This block house Mr. Clergue repaired and in it now has a comfortable and unique home. The faint line of the stockade was made permanent by a handsome stone wall surmounted by a unique parapet, and the ancient and tumble down Hudson Bay warehouses in the rear have been set upon their feet. A cannon 150 years old was found on the premises and ornaments the inclosure.

At Michipicoton Harbor, where the mining railway ends, E. V. Clergue has built a snug log dwelling upon the center of an isle of trap rock, than which no plainer lesson of the work of the glaciers has ever been noted. The entire isle is not only streaked by clear and sharp parallel lines of striation, but smooth gouges have been cut deep into the rock, running across the island from end to end. A side of one of these cuts forms half the height of one side of the building's lower story.

The Sault is so located with reference to rail and water transportation that it can send its products east or west over several lines of transcontinental rails, or by water it may reach without breaking bulk at any point on the lakes or on salt water. For the purpose of availing themselves of the new channels to Europe the company have received from England four steel steamships formerly in the Spanish ore trade, of a size to carry 2500

tous down the St. Lawrence to the ocean. They will carry ore from the mine to Midland and Hamilton, Ont., and to American ports; and in the winter will ply the Atlantic. Four more ships of a similar character, but slightly larger and better adapted for lake requirements, are under order at English shipyards, and will be on the lakes next spring. It is the company's hope that the eight, and others besides, may be employed steadily next year in carrying their ore, but it is not probable that so large an output as they expect can be made. The company will undoubtedly be able, if their ore holds up as seems probable, to compete in the United States, notwithstanding the tariff, as they have practically no fixed charges against the mine, either for purchase or development; the rail haul is but 12 miles down hill, and the lake transportation is 250 miles less than from the head of Lake Superior. This latter is but a small item of saving, however. The purchase cost of the mine was only \$500, to which the company after finding that they had an important property added employment for life to the two discoverers at a very liberal salary. D. E. W.

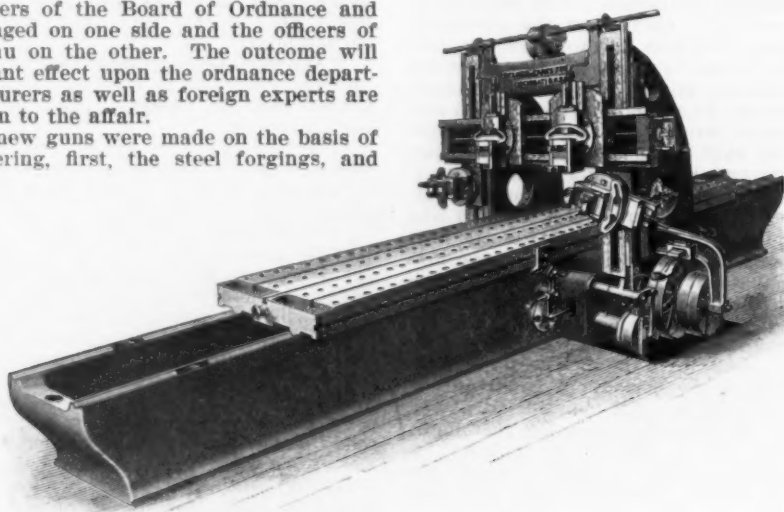
### The Contract for Field Guns.

WASHINGTON, D. C., August 7, 1900.—The Navy Department has held up the awards of contracts for the construction of 200 3-inch 15-pounder field guns of the latest and most approved patterns, bids for which were opened on August 2. The delay is the result of a controversy between the experts of the War Department, in which the members of the Board of Ordnance and Fortification are ranged on one side and the officers of the Ordnance Bureau on the other. The outcome will have a very important effect upon the ordnance department, and manufacturers as well as foreign experts are giving close attention to the affair.

The bids for the new guns were made on the basis of advertisements covering, first, the steel forgings, and

Ordnance Bureau of a type of field gun which has not been approved by the board. Certain manufacturers have been keenly alive to the relations between the board and the Ordnance Bureau and have been reluctant to enter upon experiments along the lines specifically authorized by the board. On behalf of the bureau it is alleged in this case action has been taken only after the board has been given an opportunity to select the type of gun and has failed to do so, but the members of the board controvert this statement, and it is a matter of record that just before the bids were opened for the new gun a meeting of the board was held and a protest filed with the Secretary of War against the letting of the contracts on the ground that the board had not yet adopted the design as a type. The Secretary gave the matter prompt attention, but found that the bids had already been opened, and he thereupon gave instructions that no awards should be made pending further investigation.

The Board of Ordnance and Fortification has for some time been at odds with the officials of the Ordnance Bureau. Although the Chief of Ordnance is a member of the board, that fact has not harmonized the two organizations, but has rather served to widen the breach, for General Buffington is himself the inventor of certain important devices, including a disappearing gun carriage, which he has sought to have adopted as the sole type of this kind of carriage, though the board has approved other designs. It has even been hinted that details of officers favorable to the Ordnance Bureau's designs have



THE BELMER-EAMES PLANER.

second, the finished and assembled guns. The bidders on the forgings were the Bethlehem Steel Company, the Midvale Steel Company and the Crucible Steel Company, the first two bidding 22 cents a pound and the last 19 cents, deliveries to commence in ten days and be completed at the rate of six sets of forgings weekly. The American Ordnance Company and the Bethlehem Steel Company presented bids for the work of finishing the forgings and assembling the guns, the proposal of the former company being \$535 per gun, while that of the Bethlehem Steel Company was \$1100 per gun.

The controversy which has resulted in the holding up of the awards is considered by experts to be a very serious difference of opinion between General Miles, who, in addition to being the commanding officer of the army, is *ex-officio* president of the Board of Ordnance and Fortification, and General Buffington, chief of the Ordnance Bureau. General Miles is understood to go so far as to declare that the gun for which the proposals have been received and which has been specially designed by the Ordnance Bureau as a new type of field piece is obsolete in pattern and requires the use of loose ammunition. Modern field guns, as employed by European nations, General Miles contends, are far more effective than would be the new weapon as designed by the Ordnance Bureau, and all the principal types employ the fixed ammunition. The controversy from an official standpoint possesses a special interest and may have an important bearing upon the department's policy from the viewpoint of the manufacturer. The Board of Ordnance and Fortification was specially created to investigate all new inventions and designs in guns, explosives, coast defenses, &c., and to select as well as to demonstrate their efficiency after rigid tests, the same to become standard types for the army. The members of the board therefore hold that their prerogative is invaded and the orderly development of army ordnance interrupted by the adoption by the

been secured for service on the board with a view to subordinating it to the bureau. The independence of the board has thus far been maintained, however, and an effort is now on foot to induce the Secretary of War to refer to the board the entire controversy relating to the field guns above described. The affair has now taken on the importance of a test case to determine the jurisdiction of the board, and should the contention of General Miles and his colleagues that no types can be adopted by the army without the approval of the board be sustained, the result will be of great interest to manufacturers and designers.

### The Belmer-Eames Planer.

The Belmer-Eames Tool Company of Cincinnati have brought out a new line of planers which embody valuable features. The bed and housings are of ample strength, the weights being greater than usual and the distribution of metal being such as to insure the easy working of the machine under the severest duty. The V's are extra wide, the other bearings large, and all are scraped to fit. The oiling of the V's is done by rollers running in oil pockets. The journals are provided with capped tubes of such large size as to obviate the plugging of the oil passages. The pulley shaft is supported at its outer end in a journal held by a bracket. The elevating screws run in ball bearings. All the feeds are arranged for any direction of cut simultaneously. These planers are built in sizes from 36 inches wide and upward, of any length of bed, and with two, three or four heads. The company are composed of H. Belmer, late general manager and vice-president of the Cincinnati Barbed Wire Fence Company—recently absorbed by the American Steel & Wire Company—and G. T. Eames of the G. T. Eames Company of Kalamazoo, Mich., manufacturers of drill grinders.



## Canadian News.

### Ontario Iron Ores.

TORONTO, August 3, 1900.—In the last Summary Report of the Geological Survey of Canada attention is given to the iron ore deposits of Western Ontario. Says the director:

"The extraordinary activity manifested in the extraction of iron ores in the northern portion of Minnesota, adjacent to that district of Ontario situated to the southwest of Thunder Bay, appears to render it immediately desirable that the part of the province referred to should be subjected to a careful geological examination and properly mapped. Here, as in Michigan and Minnesota, iron ores are known to occur both in the Keewatin and Animikie rocks; those of the Mattawin and Atikokan districts, upon which numerous claims have been taken up and some work of an exploring character has been done, being referable to the first named formation. These ores are chiefly magnetites, but there seems to be some possibility that 'soft ores,' for which so great a demand now exists, because of the facility of their extraction at a low cost, may yet be discovered in important quantity, particularly in association with the Animikie rocks, within the area occupied by which a number of claims have been taken up. It is, therefore, proposed, during the coming season, to undertake the work upon the map sheet immediately to the south of the Shebandowan sheet, or No. 8, in the Western Ontario series. As about half of the rectangular area of this sheet overlaps the State of Minnesota the survey of the Canadian portion should not occupy a very long time."

Of the iron ore mines of Hastings County in Central Ontario something is said. Thus the Dufferin Mine, near Malone, is reported as shipping regularly 100 tons per week to the Hamilton Furnace. Several large open pits were made to secure the ore, which occurs in large lenticular masses in crystalline limestone. "The ore is rather a pure magnetite," the report continues, "although rough sorting is necessary to rid it of the sulphides which it is apt to contain in places." The Wallbridge hematite mine near Eldorado is being steadily worked. At the Belmont Mine, where men were engaged in stripping the soil off the magnetite, ore seemed very free from sulphides. The Coe Hill Mine made a trial shipment of some of the ore that has been exposed for years in the dumps, but no account of the result has been made known.

### Calclning Works at Copper Cliff.

According to the Sudbury Journal, V. Hybrinette of the Orford Copper Company's Works, at Constable Hook, N. J., visited Sudbury recently to select a site for a plant for calcining the matte hereafter purchased from the Canadian Copper Company, and for the treatment of other ores in the district. The Orford Company are interested in copper deposits near Massey, Major Leckie being local representative of the company. A site for the calcining works near No. 1 Mine at Copper Cliff, was, the Journal says, decided on, and the construction of the works has begun. Mr. Moffatt of the Orford Company is put in charge. The plant is to be equipped with the latest designs of the Horace Brown calciner. It is expected that the works will be in operation by October 1.

### Reconstruction at Ottawa.

The Ottawa Electric Company, the larger portion of whose plant was destroyed in the conflagration of April, have completed arrangements for reconstructing their works. The hydraulic and electric equipment is to be of the very best. Contracts have been awarded for nearly all the work. In the new power house there will be three sets of water wheels and a place reserved for a fourth, should it be required. Each set will consist of three 39-inch Victor wheels, mounted on one horizontal shaft. Each set will develop 1150 horse-power. For the wheels the Stillwell-Bierce & Smith-Vall Company of Dayton, Ohio, have the contract. There will be three alternating current generators of 966 horse-power each, and room provided for a fourth. There will be two exciter generators driven by separate turbines. The arc lighting plant will consist of six generators. The contract for the arc lighting generators has been awarded to the Westinghouse Electric Company of New York, as also was the contract for the large generators, induction motors and all the other electrical apparatus. The contracts aggregate \$150,000.

The Bronson Company are busy putting in their electrical apparatus for the manufacturing of calcium carbide, which they expect to begin as soon as the water course repairs are completed.

It has not yet been decided by the Ottawa Saw Works Company whether to rebuild or not.

Work on the construction of the Victoria Foundry is being rapidly pushed.

The Chaudière Machine & Foundry Company's buildings are nearly finished.

The Baldwin Iron Works Company have begun fitting

up new premises. Their machine shop was the first to open in the Chaudière after the fire.

### Exceptional Coal Demand.

The coal companies at Cape Breton are unable to keep pace with the demand on their collieries. Though the work of mining is rushed night and day, there is still more needed than the output. No doubt more could be produced if labor were more plentiful, but men are not so eager nowadays to work in the mines as they were two years ago. Other opportunities of making as good a living at more congenial employment are now to be had. On the construction of the works of the Dominion Iron & Steel Company all the surplus labor is engaged. Owing to the shortage of men, which the mining companies are embarrassed by, hands have to be taken from the pit to do necessary work at the surface. Never before this year was the Dominion Coal Company obliged to advertise for coal cutters. New collieries have been opened by the company at Glace Bay, where 200 men have been set to work. It is calculated that the three collieries there will yield 6000 tons per day.

### Minor Notes.

New York parties have been negotiating to purchase 8 square miles of coal land in Cape Breton. The lands in question lie outside the area held by the Dominion Coal Company.

Notice has been given to the Montreal striking boiler makers by the grand secretary of the union that a meeting of the grand officers of the Executive Council will be held in Kansas City to consider the advisability of calling out all the boiler makers between Quebec and Vancouver who are employees of any concern having trouble with the union at present.

Financial arrangements for going on with the Kingston iron furnace are said to have been perfected, and construction will begin at once.

Captain Donnelly, Lloyd's inspector at Kingston, Ont., has received a letter from the Carnegie Steel Company making inquiries as to the success of deep laden vessels passing through the new 14-foot canals of the St. Lawrence. It is stated in the letter that the company intend using the canals more than formerly if heavily laden vessels can travel through them safely. Captain Donnelly sees no reason why the canals should not be safely navigable by such loaded craft.

A free site has been offered by Belleville City Council to the Cossit Bros. Company, whose large foundry was recently burnt down in Brockville. The offer is being considered.

C. A. C. J.

## Central Pennsylvania News.

HARRISBURG, Pa., August 6, 1900.—The Harrisburg Pipe & Pipe Bending Company began the regular operation of their new pipe mill to-day. There are sufficient orders on the books to assure steady running for some time. This company have had a busy season and there has been very little change from the conditions which existed a year ago. "We have nothing of which to complain," said one of the firm to-day. He expressed the belief that the bottom had been reached in the decline and that there would probably be a gradual upward turn.

The Harrisburg Boiler & Mfg. Company are finding a ready market abroad. Many shipments have been made and the demand is increasing.

The Harrisburg Rolling Mills are in operation, turning out skelp for the National Tube Company and for other pipe mills. This mill has been running fairly steady all summer.

The Central Iron & Steel Company are now running most of their mills. A pleasant incident of the week was the presentation to G. M. McCauley, the general manager, of a superb bouquet of roses by those associated with him in the office. It was a reminder of the twenty-fifth anniversary of his connection with the works. Referring to the incident Mr. McCauley said: "Twenty-five years ago the Central turned out 85 tons of steel plate per week; now the mill has a capacity of 4000 tons per week. Since 1875 two large plate mills and one universal mill have been added and arrangements completed by which the Paxton Rolling Mills were consolidated with the Central Iron Works. During this period a great development in the manufacturing of steel has come about. At first we were simply making iron plates with a limited market, and now we are shipping products of iron and steel to all parts of the world." Mr. McCauley is now the treasurer and general manager of the works and is chairman of the Committee on Manufactures of the Board of Trade.

There has been no material change in the running of the various plants since last week. There is more or less activity, and for this season of the year little occasion for complaint. The Duncannon mills are all in operation and the forges at Lucknow and Marysville are both going. There is no dullness at either the Lalance-Grosjean Works or the Harrisburg Foundry & Machine Works, and the South Harrisburg Chain Works at Riverton are in operation five days a week.

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# The Iron Age

New York, Thursday, August 9, 1900.

DAVID WILLIAMS COMPANY,	- - - - -	PUBLISHERS.
CHARLES KIRCHHOFF,	- - - - -	EDITOR.
GEO. W. COPE,	- - - - -	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR.
JOHN S. KING,	- - - - -	BUSINESS MANAGER.

## Object Lessons in Currency.

Some of the currency problems which to many persons seem obscure are most simply and effectively illustrated by the more primitive operations of trade. One of these is described in a letter from a commercial traveler who has lately been in the mountains of Kentucky. While he was standing in a country store a mountaineer came in and got a drink of whisky, for which he paid a coon skin, receiving a rabbit skin in change. In another part of the store he paid the rabbit skin for some tobacco and got a squirrel skin in change, and with this and his purchases he went on his way, leaving the stranger amused at the means by which a primitive community effected its exchanges.

But there was an entire system of finance in that simple trading. In the first place, the currency was evolved out of the need of it. The Government stamp on currency is either a certificate of its weight and fineness, a mere accommodation to the mercantile community, or, upon paper, it is the obligation of a borrower. We have become so accustomed to the Government stamp on everything that serves as currency that many persons suppose it is the stamp that makes the article serve as money. Yet these Kentucky skins bore no stamp; no official had anything to do with their issue. They were, however, a commodity, capable of being used for caps and gloves, so that their value was actual; they could be acquired by a certain amount of labor with a gun, and except for their bulk were a good circulating medium.

Apparently the skins were a local currency, performing all the functions of money, and yet staying at home instead of being drained off to monetary centers. Certainly they would buy nothing in a retail store in New York or in Louisville. But the rest of the traveler's story was that once a year buyers visited the mountains and bought these skins, giving for them money with which the local dealers could settle their accounts in Louisville. So that this primitive currency did not stay at home, but was available as money at home merely because it would go to Louisville and there exchange for something else. If there had been no demand outside of the mountains for skins they would have ceased to perform the functions of money in the mountains. The fallacy of a currency that will stay at home—that is, a currency of silver or of paper that is not acceptable away from home—is once more exploded.

Another tale of primitive finance, with a lesson that is just as good in the centers of trade, comes from the Navajoes, who have been in the habit of beating the silver dollars they receive into buttons, which can be sewn upon their clothes as ornaments, and when they need to make a purchase or pay a gambling debt they divest themselves of their buttons. The white traders have lately refused to accept the buttons as the equivalent of the coins they are made from. The Indians are not familiar with gold, but if they were they would observe that gold coins could be hammered out of shape without perceptibly reducing their value. Such a coin

is a safer and a steadier unit for the measuring of commercial values—that is, prices—than a coin half of whose value is Government credit, depending on politics and accidents of commerce.

## Commercial Aspect of Labor Unions.

Like all the important economic questions of the time, that of labor unions has gotten into politics, where it is receiving the usual time serving and short sighted treatment. There is nothing either in the past history or the present aspect of our legislation to warrant any hope that this question will meet with any permanent or satisfactory settlement at the hands of either State or national legislatures—especially as all of their efforts so far have been merely bids for the votes of the laboring man, with little, if any, ideas of the intrinsic merit and justice of the questions involved. It does not need an optimistic belief in our civilization to hold that the solution will be reached in the natural way of commercial evolution by agreement and mutual concessions of the two parties to the matter—employer and employees.

In the beginning it is well to recognize the fact that the principle of organized labor has, to all seeming, come to stay, and that, therefore, the practical questions are its direction and control rather than any futile attempt at its repression. It does not follow from this that it is advisable to yield to the unreasonable demands of labor unions unless our manufacturers wish to invite the fate of the English makers, who are bound hand and foot by the absurd proscriptions of their employees, and who, consequently, find this one of the chief reasons why they are steadily losing their grip on the trade, since their effectiveness in manufacturing is hampered by this policy of killing the goose that lays the golden egg. When, as is too often the case, the demands of organized labor are both arbitrary and unreasonable and threaten the very integrity of the business then it becomes the bounden duty of the employer to resist these demands at any cost, since yielding only brings newer and still more unendurable demands later on. It does not seem to be generally recognized that in the case of a strike the advantage lies largely with the employer. If he has determination enough he is, in the long run, almost sure to win. It is not generally difficult to fill the places of the men who have gone out, and the labor unions then find themselves reduced to violence and intimidation. This alienates public sympathy and leads to the interference of the constituted authorities, who, unfortunately, have often to be forced to do their plain duty. The leaders of these strikes are too frequently mere adventurers, seeking notoriety and their own preferment, and a severe defeat seems to be the only means of having the rank and file realize the folly and futility of violence and intimidation as effective ways of enforcing their views.

It is certainly most unfortunate that organized labor should stand so largely committed to some ideas that are so thoroughly wrong and so utterly indefensible that it is not conceivable that they can ultimately prevail. The boycott and the sympathetic strike rarely prove effective, and in the end merely exasperate, though meanwhile they may completely paralyze all business activity. Equally erroneous but even more strongly indorsed by labor unions, are the plans of limiting all the output of a worker, no matter what his capacity, and of placing all employees, drones and workers alike, on an absolutely equal basis. The supremacy of American manufacturers rests primarily upon three things: The cheapness and abundance of raw material, the genius of the



inventor and the skill of the workingman; and to threaten any one of these three is to threaten this supremacy.

Indeed, the constant attempt of labor unions to benefit the incompetent worker at the expense of the skilled artisan is a standing menace to the progress of our manufactures. We are successful in this direction largely because of the individuality of our skilled mechanics, and to bring down this average by a large infusion of mediocrity and incompetence is to take a step backward. Revolutions, though, do go backward, and we are not yet prepared to exploit a socialistic theory at the expense of our commercial supremacy. It is, of course, possible to override the laws of nature for a time if we are prepared to pay the penalty. Even the labor unions of England must, ere long, recognize the fact that they are throttling English manufactures by their arbitrary requirements and slowly destroying their own means of livelihood. In this country the difficulty has been partly averted on the part of some of the older and more conservative labor unions by establishing a high standard of membership and by keeping their lodges purged of the incompetent and unreliable, so that membership in these organizations is in itself a recommendation of skill and experience.

Strikes themselves as a means of settling any dispute are not only absolute failures but are wanton violations of every economic and social law. They are inevitably accompanied by violence and disorder, or else they are but unmeaning protests. Records show that they generally fail of their purpose, and probably are the worst stumbling blocks to-day in the right progress of labor organizations. The history of the Amalgamated Association alone shows that more than once they have been brought to the verge of disruption by unsuccessful strikes. It is certainly plain enough that strikes are among the most serious evils that afflict us in a commercial way, and that reason and progress demand that some way shall be found whereby they can be prevented and yet with justice to both parties.

Of the various remedies proposed three naturally claim our attention—arbitration, co-operation and the organization of manufacturers.

In the popular mind arbitration is usually regarded as the panacea for all labor disputes, but a close examination does not bear out this view. We are confronted at the outset with the difficulty that both parties are rarely willing to submit their differences to a third party, especially if one of the contestants is persuaded that he is in the right. Until we are willing to embody compulsory arbitration as a part of the social and economic fabric this remedy must be regarded as both uncertain and impracticable. Co-operation between employers and employees as partners in the same business is really the most promising of the proposed remedies, but it is still in its experimental stage, and its general application is too remote to warrant any consideration of it at the present time.

The banding together of manufacturers, after the fashion of labor unions, has certainly in many instances proved an effective check upon hasty and unnecessary strikes. The fact that both sides are determined and well equipped for a fight has a deterrent effect upon hasty action. The realization that an open rupture means a long and expensive fight for both sides is in itself conducive to calmer counsels, conservative action and mutual concessions. The formation of such organizations among manufacturers for mutual protection and assistance will do more for the time being to prevent strikes and to bring about the proper relations between

employers and employees than all the socialistic schemes or legislative enactments with which we are so afflicted.

One impression is apt to come forward as a vivid one with those who return to this country from abroad, and that is that an enormous amount of work is still before us in the way of substituting more permanent structures for makeshifts. The air of solidity of the brick and stone dwellings and outhouses even in the smallest villages is in strong contrast with our flimsy looking frame structures. The consumption of steel in minor houses on the Continent is very great, while it is almost nil with us. While we have done a good deal to make the trestle disappear for bridging streams on our railroads and our highways, a very large tonnage must still be placed. For many years to come the approach in the cost of the materials, wood and iron, and the increasing wealth of our country, making larger capital investments possible, to save in maintenance, will give work where it may be much needed.

## OBITUARY.

C. H. B. BRECK.

Charles Henry Bass Breck, president of Joseph Breck & Sons Corporation, Boston, Mass., died on the 1st inst. Mr. Breck was born in Pepperell, Mass., August 23, 1820. Some eight years later the family moved to Lancaster. He became a partner with his father in the "New England Agricultural Warehouse and Seed Store" in 1850, and has been the senior member and head of this firm since the death of his father in 1873, and during the half century of his connection with it the business has developed into one of the most prominent in its line in the country. The house was established by his father in 1834, and was, we are advised, the first in the United States in which the seed and agricultural implement business was combined, and the third devoted to the sale of seeds. During later years wooden ware and hardware were taken up. In 1893, after having absorbed several minor concerns, Joseph Breck & Sons bought the stock and business of Parker & Wood, and combined the plants of the two houses, incorporating as the Joseph Breck & Sons Corporation, with Mr. Breck as president and his sons as secretary and treasurer. Mr. Breck had done much to advance the interests of agriculture and horticulture and had efficiently filled several responsible positions in connection with the city government. His son, Joseph F. Breck, is treasurer of the New England Iron and Hardware Association.

DE WITT CLINTON HASKIN.

De Witt Clinton Haskin, the originator of the Hudson River tunnel, and who was at the head of that undertaking for many years, died on July 17 in Buffalo, N. Y. Mr. Haskin was born in Pittstown, Rensselaer County, N. Y., in April, 1824. In 1837 he moved to Dayton, Ohio, where his father conducted a large farm and saw mill on a site now within the limits of that city. After his father's death he managed the farm and mill until 1849, when he went to California by way of the Isthmus of Panama. After recovering from his attack of Panama fever in San Francisco he went to work in a hotel, which he owned two years afterward and in the conduct of which he amassed quite a property. In 1858 he took the contract to build the California & Pacific Railroad line, connecting the city of Marysville with San Francisco. The difficulty of building a railroad in California at that time, owing to the fact that material for construction had to be carried around the Horn and the fact that the war of the Rebellion made money very difficult to obtain, can easily be imagined. The road was finished in ten years, when Mr. Haskin went to Utah and engaged in mining, finally selling a portion of his claim in the famous Emma mine. In 1872 he came to New York, and while crossing the Hudson River during a fog he realized the advantages of a tunnel, and immediately began preparations for building the same. It was in this work that he introduced his now well-known method of pneumatic construction, and which at the time caused an almost endless amount of discussion, most of which was adverse to the entire project. But Mr. Haskin had faith in his methods and sufficient capital of his own to demonstrate the feasibility of his methods without calling upon any outside assistance. The material through which the tunnel was carried was a fine quicksand and silt, having almost the

consistency of clay when nearly dry, but being extremely treacherous when saturated. It was found that the heading could be worked in steps, and as long as the air pressure within balanced or nearly balanced the hydraulic head without an equilibrium was established. The material separating the air from the water had sufficient strength, so to speak, in itself to form a very perfect barrier. This tunnel work Mr. Haskin prosecuted vigorously until 1880, when an accident occurred by which several men lost their lives. From that time to this the tunnel work has been carried forward spasmodically, about four-fifths or 4200 feet of the north tunnel being now completed. Mr. Haskin was proud of the fact that he had insisted, all through life, in being his own master. He would assume the responsibility of a difficult contract, but he would not work for wages. To illustrate this he once informed the writer that when but a boy he was requested to row the body of a drowned man some miles up the river, the pay to be according to the time occupied. This he refused, but offered to do the work for a stated sum. This principle he followed ever after. He had unbounded faith in his own ability to execute whatever he undertook, but he alone must be responsible. Before the coroner's inquiry into the cause of the accident in the tunnel he stated to the jury that he and he alone was responsible for the plans and their execution, and that censure, if any, should be meted out to him. Two years ago, while Mr. Haskins was on a Western trip, he was stricken with apoplexy at St. Paul, which ultimately resulted in his death.

#### JAMES HEMPHILL.

James Hemphill, who died at Pittsburgh on the 7th inst., was born in Mechanicsburg, Cumberland County, Pa., July 22, 1827, and lived there until 1846, when his family removed to Tarentum, in Allegheny County, Pa. At this early age the indomitable energy that characterized him through life was clearly shown, and he has often been heard to tell how, when a small boy, he worked driving a cart in building the Cumberland Valley Railroad, and with the candor which always marked his character he would tell how he thought he was the biggest man on the job, and, after all, the trained horse was really doing all the business. In 1847, after locating at Tarentum, he was apprenticed to Samuel Black (still living at McKeesport, Pa.) at the blacksmith trade, at which he served for three years. In 1850 he went to Pittsburgh and was employed under Joseph French, then the engineer and subsequently for many years the superintendent of the Pittsburgh Water Works. On Mr. French's appointment as superintendent Mr. Hemphill succeeded him as engineer. During his employment at the water works, not being satisfied with confining himself to that business alone, he devoted himself in his off hours at home to casting baggage checks, having received flattering commendations from the late Thomas A. Scott of the Pennsylvania Railroad, then superintendent of the Pittsburgh division of that road, for the finish and neatness with which he turned them out. He has very frequently referred to Mr. Scott as the man who gave him his first start in life by enabling him to earn a little extra money. About 1856 or 1857 he invested some money, with others, in a little machine shop, which was really the tool shop of the abandoned steel works of McKelvy & Blair, standing on the ground subsequently occupied by Hussey, Wells & Co., one of the first steel works in Pittsburgh. In the course of a few years he withdrew from that partnership, and in 1859 he entered into one with the late W. S. Mackintosh and H. F. Hart, in a shop at the corner of Twelfth and Pike streets, Pittsburgh, devoting his whole time to that enterprise. From this small beginning the Fort Pitt Foundry of Mackintosh, Hemphill & Co. has grown. As an engineer Mr. Hemphill was distinguished by being far in advance of his age in the prime requisites of massiveness and solidity of work. Many other engineers of that day sneered at engines Mr. Hemphill had designed and built, on account of the massiveness of their bed plates. How far Mr. Hemphill was ahead of the age at that time is shown by the relative proportions of such parts to-day, the weight, solidity and bearing surface of the bed plate being greater in proportion to the cylinder than those of the engine of 1860. While he was always keenly alive to any improvement in the economical operation of an engine, he still was firmly wedded to the fundamental principle that, for rolling mill service at least, it was more important that the engine should run every day and should not break down, and should not take extra trouble and attention, than the mere economy of fuel, or as another engineer—in some measure a pupil of his—tersely put it, "Coal is cheap, but trouble is exceedingly dear." And as the manufacturing public gradually grew up to Mr. Hemphill's ideas of strength and massiveness as prime requisites, he felt that, those points being clearly established, he would now work in economy of fuel, at the same time rigidly insisting on sim-

licity of construction and freedom from "traps." The magnitude of the present development of the steel industry may be said to rest almost entirely on Mr. Hemphill's forcing the reversing blooming mill to the front. This mill he put in at the Pittsburgh Bessemer Steel Works, the small plant from which the Homestead Works of the Carnegie Steel Company has developed. Reversing mills for steel had been made before—certainly one at the original Freedom Iron & Steel Company's plant, Lewiston, Pa.—but had been failures, very largely from the lack of that massiveness and strength which Mr. Hemphill always kept in view. The three-high blooming mill then used would cut but a sorry figure in the production of billets or slabs of infinite variations in size and section, and of great lengths, now regularly turned out every day on dozens of two-high reversing blooming mills all over the country. Mr. Hemphill was one of the few men of great energy and capacity for work who have realized, after reaching a certain age and having once succumbed to the work, that they were no longer capable of carrying the load of their youth, and in the last few years of his life he left others to work out the ideas he suggested, or confined himself to approving and improving the ideas suggested by his subordinates. Mr. Hemphill's many sided character was shown by his success in lines of business entirely removed from his original field, evidenced in 1893 when he accepted the presidency of the newly organized National Bank of Western Pennsylvania, to which his character for prudence and good business judgment lent no little strength. To those who knew him it is superfluous to say that, above even his abilities as an engineer and business man, was his unqualified integrity, business honor and sense of the strictest justice. To the latter is doubtless due the fact that in his long career as a manufacturer there was never a strike of workmen against his establishment. Where whole crafts struck, as a mass, against all establishments of the kind in the city of course he could not expect his to be an exception, but no employer in the country ever had more of the regard and confidence of his employees than he.

#### JOSEPH P. NOYES.

Joseph P. Noyes of Binghamton, N. Y., inventor and manufacturer of comb cutting machinery and several other articles of industrial value, died on August 4 at Binghamton, at the age of 62 years.

#### JOHN B. CHRISTOFFEL.

John B. Christoffel, a manufacturer of boiler tube cleaners, died on August 4 at his home in Brooklyn, N. Y., aged 78 years. He was born in Brussels, Belgium, and came to this country in 1854. In 1867 he invented the boiler tube cleaner, which he had since manufactured, building up a large business.

#### WILLIAM M'KENNEY.

William McKenney, Sr., who for the past 40 years had been engaged in the scrap iron business in Pittsburgh, Pa., died on July 23 at his home in that city, aged 84 years.

#### W. W. BALDWIN.

W. W. Baldwin, secretary and general manager of the Cleveland Co-operative Stove Company, died in a hospital in that city last Friday, as a result of a fractured skull. The injury was caused by an elevator accident. Mr. Baldwin was born at Bridgeport, Vt., February 13, 1833. In his early years he was identified with construction work for the Western Union Telegraph Company. Later he engaged in the manufacture of stoves in many parts of the country. In 1869 he removed to Cleveland, organized the Cleveland Co-operative Stove Company, and has been their manager and leading spirit ever since. Under his management the business prospered to an eminent degree, and branches were established at Springfield, Mo., and Chattanooga, Tenn. In 1891 Mr. Baldwin organized a land company at Aurora, Mo., with a capital stock of \$500,000, of which he has been president and general manager.

#### EZEKIEL R. SANKEY.

Ezekiel R. Sankey, a pioneer citizen of New Castle, Pa., is dead at the age of 83 years. In earlier years he was engaged in the blast furnace business and helped to build the first furnace at Lowellville, Ohio.

The New York office of the International Freight Bureau, established by the National Association of Manufacturers, has been transferred to 100 William Street. It is in charge of D. H. Burdett.

An unusual number of furnaces the last month have been banked for from one to two weeks, and thus in actual blast only about half time.



## Pig Iron Production Heavily Diminished.

Our returns from blast furnace owners this month show that production is being restricted with commendable vigor. Producers of pig iron have evidently quit waiting for others to blow out their furnaces, or for agreements to be made for concerted movements to restrict, but are proceeding quite generally to reduce their own output. It would be necessary to go back to April of last year to find the present condition of furnaces and producing capacity paralleled. This heavy curtailment of production should have an early effect on the pig iron market.

The weekly capacity of the furnaces in blast on August 1 compares as follows with that of the preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
August 1, 1900.....	240	244,426
July 1.....	284	283,413
June 1.....	296	296,376
May 1.....	292	293,850
April 1.....	291	290,482
March 1.....	293	292,643
February 1.....	296	298,014
January 1.....	280	294,186
December 1, 1899.....	283	296,959
November 1.....	277	288,522
October 1.....	285	278,650
September 1.....	257	267,335
August 1.....	244	267,672
July 1.....	237	263,363
June 1.....	220	251,062
May 1.....	217	250,095
April 1.....	205	245,746
March 1.....	192	228,195
February 1.....	195	237,639
January 1.....	200	243,516
December 1, 1898.....	195	235,328
November 1.....	196	228,635
October 1.....	192	215,635
September 1.....	186	213,043
August 1.....	187	206,777
July 1.....	185	216,311
June 1.....	190	225,398
May 1.....	194	234,163
April 1.....	194	233,339
March 1.....	193	234,430
February 1.....	184	228,338
January 1.....	188	226,608

The condition of the charcoal furnaces at the beginning of the month was as follows:

Charcoal Furnaces in Blast August 1, 1900.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New England.....	7	3	275	4	360
New York.....	12	12	214	0	0
Pennsylvania.....	13	10	100	11	370
Maryland.....	4	0	0	4	536
Virginia.....	4	0	0	4	338
Ohio.....	7	3	304	4	312
Kentucky.....	3	0	0	3	300
Tennessee.....	7	4	938	3	530
Georgia.....	3	1	336	2	400
Alabama.....	5	4	1,374	1	100
Michigan, Missouri and Wisconsin.....	15	11	4,804	4	1,450
Texas.....	4	1	150	3	785
Totals.....	74	31	8,295	43	5,561

As compared with previous months the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
August 1, 1900.....	31	8,395
July 1.....	32	8,492
June 1.....	27	7,605
May 1.....	25	6,894
April 1.....	29	7,838
March 1.....	29	7,047
February 1.....	32	8,004
January 1.....	30	7,457
December 1, 1899.....	30	7,511
November 1.....	29	7,113
October 1.....	25	6,222
September 1.....	24	5,665
August 1.....	22	6,189
July 1.....	20	6,018
June 1.....	16	4,943
May 1.....	20	4,846
April 1.....	17	4,777
March 1.....	16	4,330
February 1.....	17	4,967
January 1.....	20	6,026
December 1, 1898.....	18	6,018
November 1.....	20	5,947
October 1.....	20	5,732
September 1.....	21	6,233
August 1.....	22	6,459
July 1.....	19	5,647
June 1.....	20	6,782
May 1.....	18	6,571
April 1.....	16	5,716
March 1.....	16	5,470
February 1.....	14	4,734
January 1.....	16	5,442

The condition of the coke and anthracite furnaces at the beginning of the month was as follows:

Coke and Anthracite Furnaces in Blast August 1, 1900.

Location of furnaces.	Total No. of stacks.	No. in blast.	Capacity per week.	No. out of blast.	Capacity per week.
New York.....	13	5	5,858	8	7,367
New Jersey.....	7	4	2,444	3	1,623
Spiegel.....	3	1	166	2	334
Pennsylvania:					
Lehigh Valley.....	29	16	9,302	13	5,312
Spiegel.....	1	1	91	0	0
Schuylkill Valley.....	15	10	7,331	5	2,500
Upper Susquehanna.....	5	1	1,162	4	3,110
Lower Susquehanna.....	9	4	4,366	5	2,086
Spiegel.....	1	1	385	0	0
Lebanon Valley.....	13	4	3,010	9	8,159
Pittsburgh District.....	30	26	57,254	4	8,373
Spiegel.....	1	1	1,400	0	0
Shenango Valley.....	15	12	16,143	3	3,677
Western Pennsylvania.....	19	10	12,782	9	5,229
Spiegel.....	1	1	630	0	0
Maryland.....	4	3	4,280	1	175
Spiegel.....	1	1	833	0	0
Wheeling District.....	10	7	9,441	3	4,000
Ohio:					
Mahoning Valley.....	14	9	17,876	5	7,882
Central and Northern.....	11	6	8,437	5	11,298
Hocking Valley.....	2	2	836	0	0
Hanging Rock.....	13	2	4,529	11	1,508
Illinois.....	14	13	23,866	1	1,342
Spiegel.....	2	1	860	1	810
Wisconsin and Minnesota.....	6	2	1,304	4	4,195
Missouri.....	2	1	900	1	350
Colorado.....	2	2	2,674	0	0
The South:					
Virginia.....	21	13	9,376	8	4,170
Kentucky.....	6	4	1,345	2	1,200
Alabama.....	38	29	30,890	9	4,650
Tennessee.....	13	10	6,545	3	1,862
Georgia.....	1	0	0	1	450
North Carolina.....	2	1	85	1	352
Totals.....	224	209	236,131	115	92,514

In comparison with previous months the record of the coke and anthracite furnaces stands as follows in gross tons:

	Number in blast.	Capacity per week.
August 1, 1900.....	209	236,131
July 1.....	252	274,921
June 1.....	296	288,771
May 1.....	267	286,956
April 1.....	292	281,644
March 1.....	294	285,596
February 1.....	264	290,010
January 1.....	250	286,729
December 1, 1899.....	253	289,448
November 1.....	248	281,409
October 1.....	241	272,436
September 1.....	233	261,670
August 1.....	222	261,483
July 1.....	217	257,345
June 1.....	204	249,119
May 1.....	197	245,249
April 1.....	188	240,969
March 1.....	175	223,865
February 1.....	178	232,672
January 1, 1899.....	180	237,490
December 1, 1898.....	177	229,510
November 1.....	176	222,988
October 1.....	172	209,903
September 1.....	165	206,750
August 1.....	165	200,318
July 1.....	166	210,664
June 1.....	170	218,636
May 1.....	176	227,592
April 1.....	178	227,623
March 1.....	177	223,960
February 1.....	170	223,604
January 1, 1898.....	172	221,166

### Furnace Stocks.

Stocks of pig iron have increased during the month 83,303 tons, as compared with stocks at furnaces on July 1. This is not quite so large an increase as that reported in June.

The position of furnace stocks, sold and unsold, as reported to us, was as below on August 1, the same furnaces being represented as in former months. This does not include the holdings of the steel works producing their own iron.

Stocks.	Jan. 1.	Apr. 1.	May 1.	June 1.	July 1.	Aug. 1.
Anthracite and Coke.....	107,331	177,650	216,182	305,952	387,482	460,824
Charcoal.....	30,115	19,882	24,895	28,728	33,556	43,517
Totals.....	137,346	197,532	241,077	334,680	421,038	504,341

### Warrant Stocks.

The American Pig Iron Storage Warrant Company report receipts into the warrant yards during July of 8600 tons and deliveries of 600 tons, showing a gain in stocks of 8000 tons during the month, making the following showing as compared with previous months:

Stocks.	Jan. 1.	Apr. 1.	May 1.	June 1.	July 1.	Aug. 1.
Coke and Anthracite.....	3,200	1,500	2,600	3,400	4,400	19,000
Charcoal.....	1,700	1,400	1,400	1,400	1,400	1,800
Totals.....	4,900	2,900	4,000	4,800	5,800	20,800

## MANUFACTURING.

### Iron and Steel.

At a meeting of the Board of Directors of the Shelby Steel Tube Company, held at the general offices in Cleveland, Ohio, last week, W. E. Miller was elected chairman of the Board of Directors, Chas. T. Boynton president, W. S. Miller treasurer, and H. H. Cockley secretary. All above to take effect August 15. At this meeting it was decided that the general offices of this company shall remain in Cleveland.

The Shenango Works of the National Steel Company, at New Castle, Pa., which have been idle for some time, were started up in all departments on Sunday night, August 5. The plant has been extensively repaired during the shut down, and the Bessemer mill, in connection with the bar mill, gives employment to about 600 men. W. H. Lewis is superintendent of this plant.

We have been officially advised that the report that the Republic Iron & Steel Company would dismantle the Haselton mill at Youngstown, and ten other small mills is untrue. It is doubtful, however, whether the Republic Iron & Steel Company will ever again operate the Leetonia mill at Leetonia, Ohio, but the only plant which the concern have decided to dismantle is the one at Peoria, Ill., which they have never operated and which was idle for several years prior to its being taken over by the Republic Iron & Steel Company.

Report has it that Collis P. Huntington proposes to build a large steel plant in connection with his shipbuilding yard at Newport News, Va.

The men at the works of the Sweet's Steel Company of Syracuse, N. Y., have struck against a reduction in wages.

The Sylvan Works of the Republic Iron & Steel Company at Moline, Ill., are undergoing considerable improvement. Additional steam power is to be supplied by two Hyde tubular boilers of the latest type. Two new Lauth furnaces are also being built, one for coal and the other for gas. A 50-ton track scale, three new hot beds, a set of 18-inch rolls and a new engine are also being installed. With the new machinery at work it is expected that the output will be 25 per cent. greater than before. It is understood that the cost of the improvements will approximate \$25,000.

The steel plant of the Tennessee Coal, Iron & Railroad Company at Ensley, Ala., is about to start up again, after having been closed down for repairs.

The Duquesne Steel Works of the Carnegie Steel Company, at Duquesne, Pa., are now in full operation in all departments. During the shut down some needed repairs were made.

Furnace B of the Edgar Thomson group of the Carnegie Steel Company, at Bessemer, Pa., was put in on Saturday night, August 4, after a shut down of a month for repairs. The furnace has been materially improved and the capacity increased. Furnace E of the same plant will be shut down this week for repairs and improvements. A complete electrical equipment will be installed at the furnace.

A large number of men, embracing the clerical forces and the machinists of the Republic Iron & Steel Company at Youngstown, Ohio, were dismissed on Saturday night, August 4. Heads of departments were retained. The dismissal is due to the failure to settle the Amalgamated scale, which has caused a shut down of all the mills of this concern.

Jefferson Furnace, at Steubenville, Ohio, operated under lease by the National Steel Company, has been closed down.

Work is being pushed as fast as possible on the new blast furnace, open hearth plant, rod and wire mills being erected by the Union Steel Company at Donora, Pa., about 40 miles from Pittsburgh. Nearly 500 men are at present employed doing the excavating and getting the ground in shape for the buildings. It is expected that this plant will be ready for operation in the early part of 1901. The rod and wire mills will be finished ahead of the blast furnace and steel plant, and it is hoped they will be rolling rods and making wire and wire nails not later than January 1.

The McKeesport works of the National Tube Company, at McKeesport, Pa., are in full operation, and not closed down as reported. This plant was idle some little time since only to take stock and make a few incidental repairs.

The New Castle mills of the National Steel Company resumed operations Sunday, August 5, after being shut down six weeks for repairs.

The Spring Valley Furnace, Spring Valley, Wis., is to blow out on the 23d inst.

The Olive Furnace, Lawrence, Ohio, is to blow in the current week.

The Old Meadow works of the American Sheet Steel Company, at Scottdale, Pa., have recently been extensively repaired and a considerable number of improvements made. This plant will be put in operation at an early date.

We are officially advised that the report that the American Tin Plate Company would remove their Star Works, in Pittsburgh, to some other location is untrue. The removal of this plant at this time is not contemplated.

The strike at the National mills of the American Tin Plate

Company, at Monessen, Pa., has been settled. Some extensive additions and improvements are to be made to this plant, which will largely increase its capacity.

No final settlement of the labor trouble at the plant of the Burgess Steel & Iron Works, Portsmouth, Ohio, has been made, but the men are at work. Their contention was for the signing of the Amalgamated scale, which the firm have refused to do. The fact that the men have returned to work is taken as evidence that the signing of the scale will not be insisted upon.

The Allegheny Steel & Iron Company have been organized at Pittsburgh, and will apply for a charter on August 24. The concern propose to establish a plant at Tarentum, Pa., and will make light goods in iron and steel.

The Bessemer Rolling Mill Company, Bessemer, Ala., one of the largest bar iron mills in the South, have signed the Amalgamated Association scale.

The report that the Warren works of the National Tube Company, at Warren, Ohio, would be dismantled is untrue. It is a fact that the coupling department of the Warren plant is being removed to the Continental works in Pittsburgh, but the balance of the Warren plant will remain in Warren. Hereafter all couplings will be made at the Continental works, and any that may be needed at the Warren works will be shipped there.

The Ohio Iron & Steel Company blew out their Mary Furnace at Lowellville, Ohio, last week. It is believed that within 60 days there will not be more than half a dozen furnaces in blast in the Mahoning and Shenango valleys.

The Lake Erie Iron Company, at Cleveland, Ohio, manufacturers of bar iron, have signed the Amalgamated Association scale. The report that this concern are one of the constituent interests of the Republic Iron & Steel Company is untrue, and the signing of the scale by this concern in no way affects the position of the Republic Iron & Steel Company in refusing to sign the Amalgamated Association scale.

Westerman & Co., operating Westerman Rolling Mill, at Lockport, N. Y., have signed the Amalgamated Association scale.

The stockholders of the Belfont Iron Works Company, at Ironton, Ohio, met last week and elected the following Board of Directors: John G. Peebles and John Peebles of Portsmouth, Robert Peebles of Ashland, B. H. Burr, Thomas Parker, R. C. Burr and S. B. Steece of Ironton. The directors organized by electing the following officers: John G. Peebles, president; B. H. Burr, vice-president and general manager; S. G. Giffillan, secretary and treasurer. The board passed a resolution to immediately equip the nail factory with wire nail machines and a wire drawing plant. The wire nail machines will supplant about one-half of the 120 cut nail machines now in operation. The wire drawing plant will likely be put in that portion of the mill now occupied by the forge department, and work will begin as soon as contracts can be closed for the necessary equipment.

Claire Furnace of M. A. Hanna & Co., at Sharpsville, Pa., has been blown out. The furnace will be improved and considerable repairs made.

One of the Youngstown papers claims that Girard Iron Company, operating Mattie Furnace at Girard, have nearly 30,000 tons of pig iron piled in their yards.

The Chester works of the American Sheet Steel Company, at Chester, W. Va., are ready for operation, and will likely be started up in a short time. This plant was built originally by Chester Rolling Mill Company, and was taken over by the American Sheet Steel Company when that concern were organized.

The creditors of the Amos & Davis Iron Company, operating Center Furnace at Ironton, Ohio, met last week and arrangements were made to continue the furnace in operation. Geo. N. Gray has been appointed manager.

It is reported that the Shelby Tube Company of Albany, Ind., have resumed operations after extensive repairs just completed. It is announced that the company have orders ahead sufficient to keep the plant running for one year.

The Lake Erie Iron Company, Cleveland, Ohio, announce that they are now operating their 10-inch mill and are prepared to furnish rounds in iron from  $\frac{5}{8}$  to  $1\frac{1}{2}$  inch, inclusive.

### Machinery.

It is reported that the shops of the Baltimore & Ohio Railroad at Grafton, W. Va., are to be removed to Fairmount, W. Va.

The Gelser Mfg. Company, Waynesboro, Franklin County, Pa., will erect a new boiler shop, which will be 100 x 200 feet in size and is to consist of three aisles. The side aisles are each 30 feet wide, thus making the center aisle 40 feet in width. The center aisle is higher than the side aisles, and that part of it which rises above the roof of the side aisles is made up of two continuous rows of windows, one on each side of this aisle. The framework of the building is to be composed of structural steel, the roofing is to consist of corrugated iron laid directly on steel channels serving as purlins, and the outside walls will be made of bricks filled in between the steel columns. In the length direction of the building the steel columns and the roof trusses will be spaced 20 feet apart. Over the last 20 feet of the center aisle at the one end of the building is to be erected a tower, which is intended to give the head room necessary for the manipulation of the hydraulic riveters, which are to be placed there. Besides these riveters the building is to be equipped with the



best and most modern machinery and appliances made for boiler shop use. Conspicuous among these will be a 350-ton hydraulic hanging press, built by the Chambersburg Engineering Company, Chambersburg, Pa. This firm is also to furnish the hydraulic riveter and the whole hydraulic plant is to be installed. The center aisle of the building is to be spanned by a traveling crane, and above the hydraulic riveters another traveling crane is to be located. The side aisles are to be equipped with jib cranes so placed that they are not only able to reach the territory of the traveling crane, but are able also to reach the field of action of each other. The contract for the erection of the building has been awarded to the Smith Mfg. Company of Waynesboro, Pa.

The Providence Engineering Works, Providence, R. I., recently secured a contract from the American Sugar Refining Company of New York for two engines of a maximum capacity of 3000 horse-power, and work on the drawings and patterns has been started at the South Main street plant of the company. The circumstances attending the placing of this order make the selection of the Providence engine flattering to its builders. The Sugar Refining Company's engineers are completely reorganizing the system of power generation at their principal works in Brooklyn. The system decided upon involved concentrating the scattered power plants in one building, with two central compound engines, introducing the best features and economies known to modern power generation. After thorough investigation the engineers selected the Rice & Sargent engine as promising the results desired, and the order was placed with the Providence Engineering Works, the exclusive makers of that engine. This order is one of a large number which the Providence Engineering Works have now under construction, among the others being two 4000 horse-power engines, with a maximum capacity of 6000 horse-power each, to be used in operating the new elevated railway system in Boston. The works are in constant operation day and night.

The Hennessy Foundry Company, Springfield, Ohio, who recently started up their plant, were visited by fire on the 27th, entirely destroying the same. The company will at once rebuild and upon a much larger scale, and expect to be in full operation again by Sept. 1.

S. G. Barker & Son, Scranton, Pa., manufacturers of railroad track scales, coal screens and machinery, have had an unusual demand for track scales this year caused by the railroads building larger cars. Business in their other lines has been above the average.

Selders & Co., East Stroudsburg, Pa., who originated the International Boiler Works at Stroudsburg, sold out their interest in February last and have erected a new plant at East Stroudsburg for the manufacture of boilers, tanks, receivers, smoke stacks, &c. The main building is 120 feet square, besides which there are office, engine and stable buildings. Machinery of the most modern type is about being put in, and matters are so forward that they are prepared to give estimates on work requiring to be executed immediately.

The International Boiler Works Company, Stroudsburg, Pa., who were incorporated with a capital of \$50,000 in February last, purchased the International Boiler Works from the proprietors, Selders & Co. They have just made an addition of \$20,000 to the capital stock to secure heavy machinery and carry out improvements. Since entering upon the business they have been rushed with orders and at present have all they can attend to. Among firms for whom they are manufacturing are the Rand & Sargent Drill Companies, Clayton Air Compressor Company, L. Flory & Co., Bangor, Pa., and the Montella Brick & Clay Company, Reading, Pa. For the latter they are building four 72 x 18 boilers, to be set up complete.

Carter & Allen, Tamaqua, Pa., have been awarded the contract for furnishing the Colebrook Furnace, at Lebanon, Pa., with a new blowing engine. A new engine house will be erected at the furnace.

The Garland Foundry Company, Cleveland, Ohio, have increased their capital stock from \$50,000 to \$100,000.

The report that the Carroll-Porter Boiler & Tank Company, whose plant in Pittsburgh was burned some time since, would locate at Newport, Ky., is untrue. The concern have no intention whatever of going to this place. It is probable that when their plant is rebuilt they will locate at some point outside the Pittsburgh district, but at this time a definite location for the new works has not been selected. At the old plant on Penn avenue, Pittsburgh, part of the equipment has been temporarily rigged up and some work is being done.

The John Wood Mfg. Company of Conshohocken, Pa., have recently booked large orders for the Wood water tube boilers from all parts of the world, among them an order from the South Chester Tube Company, the Roane Iron Company, Chattanooga, Tenn., Richard Heckscher Sons' Company, Swede Furnaces and many others from Arizona, South America, South Africa and Europe. The company now have several large works building their boilers.

A large contract for engines has been secured by Houston, Stanwood & Gamble to equip with power a number of cotton gins in different parts of the South. The contract is for 15 100 horse-power engines for the American Circular Bale Company, the

company that have been furnishing machinery for making the round cotton bales. In connection with this order a peculiar fact has been brought out, and that is that the American Cotton Company, in their business of manufacturing cotton seed oil, have found it to advantage to put in cotton gins of their own in many parts of the South in order that they may gin the cotton and get the seed itself. This company have placed an order to lease from the round bale machinery manufacturers a large number of their baling machines.

The executive and general offices of the Bullock Electric Mfg. Company have been removed from Cincinnati to New York. The company have had a New York office for some years in the St. Paul Building, and President George Bullock has spent about half of his time there all along. He will in the future make his headquarters there, but will be in Cincinnati a good portion of the time as well. The general sales department will be located in New York, and this is but in line with the growth of the business of the company, that has been largely in the East and across the water. The advertising department has also been taken along with the other departments. Vice-president Joseph S. Neave will, according to the present arrangement, remain in Cincinnati in control of the operation of the factory, and in every other way the business of manufacturing electrical machinery will be carried on in the same way as hitherto. President Bullock is at this time abroad, and the arrangements for the change have been carried out along lines mapped out before he left.

The Philadelphia Record states that the Foran Foundry & Mfg. Company of Flemington, N. J., have been awarded the contract for all the iron columns to be used in the stations of the underground railway in New York City. It will take two years to complete the work and employment will be given to many more hands.

#### Hardware.

Fox Cutlery Company, Dubuque, Iowa, report a very large trade in their Fox razors, and are very much pleased with the change they made from the general cutlery to the exclusive razor manufacturing business.

The G. White Axe Company, Honesdale, Pa., are working full time at present and prospects for the future are regarded as very bright. They make a specialty of manufacturing steel bark spuds.

**The Strike of the Machinery Molders.**—Our advices from Cleveland state that according to an interview with Secretary John A. Penton of the National Founders' Association that organization is now meeting with decided success in securing men to take the places of the striking machinery molders. He stated on Monday that nearly 100 men are at work in the various foundries of the city and others are being secured. At this rate, according to his opinion, the strike will soon be practically broken, since the full quota of men who went out will not be required to take care of the necessary work for some time to come on account of the existing lull in business. The men are being secured from all parts of the country, largely from the East, and are being paid \$2.75 a day, with a bonus of \$2 a day in addition. Mr. Penton stated that the foundrymen were determined to win out in this fight and that if necessary the bonus offered would be continued indefinitely. According to Mr. Penton the union leaders are said to have admitted that some 65 men were at work. Through the daily papers, however, which are inclined to partiality on the side of the strikers, the union leaders claim that only 25 men have been imported and that many of these are inefficient. It is said that the men are hired for 60 days and can be discharged before that time if considered inefficient, in which case the men are charged their railway fares to Cleveland. Although the strike has been on about four weeks, it has been accompanied by no disorder and with little or no abuse for the imported men. The striking molders are drawing \$7 per week from the national body. They claim that the organization will keep up the payments for years if necessary. There seems to be little probability that the men in other portions of the district will be called out. The administrative council of the National Founders' Association met at Cleveland, Monday, August 6, to confer with the Cleveland association and to decide on a plan of action for continuing the fight against the striking molders in that district. The situation was gone over in all its details, after which the administrative council decided on an appropriation of \$100,000 from the association's surplus fund for the purpose of carrying on the strike. The bulk of the appropriation will be used in importing more men, as it was decided that it would be folly to make any concessions to the strikers whatever. The administrative council of the association was created several years ago for the purpose of looking into strikes and rendering financial aid when it was necessary. It is composed of eight men and has power to make any appropriation it sees fit. The members of the council left the city immediately following the conference. Great secrecy was maintained regarding the session.

## The Iron and Metal Trades.

The only effective remedies to restore the Iron industry to a normal and sound condition are now being automatically applied, and will do more to inspire confidence than all palliatives. These are an extremely sharp reduction in the production of Pig Iron, and quite an active export movement, with the prospect that the latter will expand considerably, since the margin now is very satisfactory.

As bearing on the first point, our reports from blast furnace owners show that furnaces have been blown out wholesale during July, making a staggering reduction in the active producing capacity on August 1. At that date 240 furnaces of all kinds were in blast with a weekly capacity of 244,426 tons, against 284 furnaces on July 1, with a weekly capacity of 283,413 tons. This is restriction of production in earnest, and it should soon put the Pig Iron market in better shape, particularly when it is considered that the movement has not yet exhausted itself. In fact, in an informal manner the furnace owners of the Central West have decided to bank a number of stacks on September 1 which are now running.

The furnaces which have been blown out in the past month are scattered all over the country, as follows: New York, Niagara, 1 stack; Lehigh Valley, Pa., Allentown Iron Works 1, Allentown Rolling Mill 2, Thomas Iron Company 2; Upper Susquehanna Valley, Pa., Lackawanna 2, North Branch 1; Lower Susquehanna Valley, Pa., Chickies 2, Aurora 1, Vesta 1; Lebanon Valley, Pa., Bird Coleman 2, Colebrook 2, North Cornwall 1; Western Pennsylvania, Juniata 1, Kemble 1; Shenango Valley, Pa., Claire 1, Ella 1; Pittsburgh, Pa., Edgar Thomson 1, Eliza 1; Maryland, Muirkirk 1; Virginia, Ivanhoe 1, Covington 1; Northern Ohio, Newburgh 1, Lorain 2, Franklin 1; Mahoning Valley, Ohio, Mary 1; Wheeling District, Ohio, Jefferson 1; Hanging Rock Region, Ohio, Lawrence 1, Madison 1, Olive 1; Alabama, Clifton 1, Alice 1; Illinois, Union 2; Wisconsin, Bay View 2, Mayville 1.

In some instances the proprietors of the furnaces blown out state that their action is taken for the purpose of making repairs, but in such times as these repairs are not usually done under pressure, and it may be assumed that after the repairs are completed such furnaces will not be blown in unless their product is needed. Meanwhile, other furnaces are to be blown out as soon as stock now in hand is used.

It is true that the August report shows a further accumulation of stocks, but the rate of reduction of output in the last month represents about 170,000 tons per month, or about double the recent monthly rate of accumulation of metal.

In the meantime the closing down of so many rolling mills on account of labor difficulties and for other causes must be leading to a steady depletion of stocks of finished goods, so that in that direction, too, the situation is becoming intrinsically sounder.

Then we are finding relief in our export trade. Very considerable quantities of Steel Billets, Tin Plate and Sheet Bars, Skelp, Wire Rods and finished articles have been shipped, and have been contracted for shipment, at prices which net rather better than for the home market, in spite of the fact that they are very much lower than those ruling in the British open markets. In other words, there is the prospect that considerable additional business may be put through, although freight rates are high and show a stiffening tendency. Costs abroad are on a high level, through scarce fuel, high labor and costly Ores.

Prices here are to some extent unbalanced, finished products being relatively much lower than the cruder or semifinished forms, a condition of affairs which practically rules out those who do not control the materials from the ground up. If the demand must call upon them for product, the raw material must decline or the finished product must advance.

## A Comparison of Prices.

At date, one week, one month and one year previous.

### Advances Over the Previous Month in Heavy Type, Declines in Italics.

	Aug. 8, 1900.	Aug. 1, 1900.	July 12, 1900.	Aug. 9, 1899.
<b>PIG IRON:</b>				
Foundry Pig, No. 2, Standard, Philadelphia.....	\$16.25	\$16.25	\$16.75	\$20.50
Foundry Pig, No. 2, Southern, Cincinnati.....	14.50	15.50	17.00	18.25
Foundry Pig, No. 2, Local, Chicago.....	16.00	16.50	18.50	20.00
Bessemer Pig, Pittsburgh.....	16.00	16.00	16.00	21.25
Gray Forge, Pittsburgh.....	14.00	15.00	16.50	17.75
Lake Superior Charcoal, Chicago.....	30.00	21.00	22.00	22.00
<b>BILLETS, RAILS, ETC.:</b>				
Steel Billets, Pittsburgh.....	18.00	19.00	20.00	34.50
Steel Billets, Philadelphia.....	20.50	20.50	25.00	36.00
Steel Billets, Chicago.....	20.00	20.00	.....	36.80
Wire Rods, Pittsburgh.....	35.00	35.00	35.00	44.00
Steel Rails, Heavy, Eastern Mill.....	35.00	35.00	35.00	30.00
Spikes, Tidewater.....	2.00	2.10	2.15	2.15
Splice Bars, Tidewater.....	2.00	2.00	2.00	1.95
<b>OLD MATERIAL:</b>				
O. Steel Rails, Chicago.....	9.50	9.50	11.00	15.00
O. Steel Rails, Philadelphia.....	13.00	12.00	13.00	17.00
O. Iron Rails, Chicago.....	12.50	12.50	14.00	20.00
O. Iron Rails, Philadelphia.....	14.00	14.00	15.00	21.00
O. Car Wheels, Chicago.....	15.00	16.00	18.00	15.50
O. Car Wheels, Philadelphia.....	17.00	17.00	19.00	17.00
Heavy Steel Scrap, Chicago.....	9.00	9.00	10.00	14.00
<b>FINISHED IRON AND STEEL:</b>				
Refined Iron Bars, Philadelphia.....	1.25	1.25	1.45	2.00
Common Iron Bars, Youngstown.....	1.25	1.25	1.35	1.85
Steel Bars, Tidewater.....	1.15	1.20	1.45	2.30
Steel Bars, Pittsburgh.....	1.00	1.00	1.15	2.10
Tank Plates, Tidewater.....	1.30	1.30	1.45	2.70
Tank Plates, Pittsburgh.....	1.10	1.10	1.15	2.50
Beams, Tidewater.....	2.05	2.05	2.05	2.15
Beams, Pittsburgh.....	1.90	1.90	1.90	2.00
Angles, Tidewater.....	1.95	1.95	1.95	2.15
Angles, Pittsburgh.....	1.80	1.80	1.80	2.00
Skelp, Grooved Iron, Pittsburgh.....	1.25	1.25	1.25	2.25
Skelp, Sheared Iron, Pittsburgh.....	1.25	1.25	1.30	2.60
Sheets, No. 27, Chicago.....	3.05	3.15	3.10	3.18
Sheets, No. 27, Pittsburgh.....	2.85	2.95	2.90	3.00
Barb Wire, f.o.b. Pittsburgh.....	2.80	2.80	2.80	3.10
Wire Nails, f.o.b. Pittsburgh.....	2.20	2.20	2.20	2.50
Cut Nails, Mill.....	1.95	1.95	1.95	2.30
<b>METALS:</b>				
Copper, New York.....	16.50	16.37½	16.25	18.50
Silver, St. Louis.....	4.50	4.00	4.10	5.75
Lead, New York.....	4.25	4.25	4.00	4.50
Lead, St. Louis.....	4.20	3.95	3.95	4.57½
Tin, New York.....	31.65	32.50	32.25	32.25
Antimony, Hallett, New York.....	9.50	9.50	9.62½	9.75
Nickel, New York.....	55.00	55.00	55.00	56.00
Tin Plate, Domestic Bessemer, 100 lbs., New York.....	4.84	4.84	4.84	4.55

### Chicago. (By Telegraph.)

Office of The Iron Age, 1205 Fisher Building,  
Chicago, August 8, 1900.

The activity in Bars has almost run its course, and the market has both quieted and strengthened. There remains quite a tonnage to place, but it may be distributed over an extended period of time if the policy of buying only for three months at a time, adopted by some consumers, is pursued through the year. Among the closing events of this activity last week was the purchase of a tonnage estimated at 35,000 by a leading implement maker at Chicago, about 20,000 tons by one at West Pullman, and about 4000 tons by one at Milwaukee. Sheets seem to have succeeded to a fair share of the departed activity. While buying is not large in comparison with Bars, it shows great strides as compared with the state of trade for some time past. This is the beginning of the natural season for Sheets, and a good trade is anticipated for some time to come. Manufacturing, it is supposed by some business men, has been perceptibly quickened by this splurge in Bars, the beneficial results to be felt for many months to come. In somewhat striking contrast has been the slow progress in building operations, crippled as they have been by the labor troubles. While Shapes have been selling reasonably well for manufacturing plants, for small structures and for various miscellaneous purposes, it is stated on good authority that in the whole United States this year only one large office building of Steel construction has been contracted for, though a very large amount of business closed last year has been completed. This, it is argued, implies that the demand for Shapes in the near future must be quite large from very accumulation of needs.

**Pig Iron.**—The inherent character of the Pig Iron market has not changed. There are surface variations, more or less transitory, but the distinguishing characteristic of trade is the hesitation of buyers to close for future needs. The Bar episode only confirms them in this attitude, for the relative prices portray to them a discrepancy, which they wait to see removed. Without pretending to forecast the future of Pig Iron, some factors point out that Foundry Pig Iron is produced by furnacemen who have to buy high priced Ore and Coke, whereas the large Steel producers may have the advan-



tage of inside figures on Ore and Coke from production by themselves. The one Steel interest, it is stated, which makes Foundry Pig Iron for the general market bought a considerable share of the Ore so used under contract at last January's prices. Production of Foundry Pig Iron in this territory has been cut in two by the closing of the two Bayview furnaces and the Mayville Furnace, leaving only the Iroquois, Calumet and Minerva in operation, and one of these, it is said, may soon blow out. The matter of production or nonproduction will, therefore, in all probability, soon be a factor in the situation. Trading this week has been of a fairly good character, though mainly for nearby wants. Melters are ready to give large orders just as soon as the time looks ripe for that action. Within the past few days a number have asked the advice of sellers from whom they have been accustomed to buy, some requesting that their orders be entered when competitors buy. For quick needs the volume of Iron is large. Values still slowly yielding. Quotations follow:

Lake Superior Charcoal.....	\$20.00 to \$21.00
Local Coke Foundry, No. 1.....	17.00 to 17.50
Local Coke Foundry, No. 2.....	16.00 to 16.50
Local Coke Foundry, No. 3.....	15.50 to 16.00
Local Scotch, No. 1.....	17.00 to 17.50
Ohio Strong Softeners, No. 1.....	18.50 to 19.00
Southern Silvery, according to Silicon..	18.35 to 19.35
Southern Coke, No. 1.....	16.85 to 17.85
Southern Coke, No. 2.....	15.85 to 16.35
Southern Coke, No. 3.....	15.35 to 16.35
Southern Coke, No. 1 Soft.....	16.85 to 17.85
Southern Coke, No. 2 Soft.....	15.85 to 16.35
Foundry Forge.....	14.85 to 15.85
Gray Forge and Mottled.....	14.35 to 14.85
Southern Charcoal Softeners, according to Silicon.....	18.35 to 19.35
Alabama and Georgia Car Wheel.....	21.85 to 22.85
Malleable Bessemer.....	18.00 to 19.00
Standard Bessemer.....	19.00 to 20.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon.....	22.00 to 23.00

**Bars.**—The Bar situation is considerably mixed. The halt in adjustment of the wage scale has occasioned constraint in some directions, and the extreme low prices named have also cut off some sources of production. The disposition of small Iron mills is to retire from the field until a reaction comes. There has already been some indication of that reaction. Generally speaking, irregularity exists. Some producers of Steel have quoted lower than others, and the low priced makers are not those of a week or two ago. But most producers are fairly well satisfied with the state of their order books and have advanced quotations. A good average price for Steel Bars in round lots is 1.25c., Common Iron selling somewhat higher. From store Iron and Steel are about 1.75c., and Hoops at 1.90c. to 2c.

**Structural Material.**—There is fair business in a small way, but no large contracts have been closed. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 2.05c.; 18 inches and over, 2.15c.; Angles, 3 inches and over, 1.95c.; Angles under 3 inches, 1.35c.; Tees, 2.10c.; Universal Plates, 1.35c. From local yards small lots of Beams and Channels are quoted 2.55c. to 2.75c.; Angles, 2.20c. to 2.30c. rates, and Tees, 2.40c. to 2.60c.

**Plates.**—Some disposition of boiler makers is shown to contract for their future needs, though on the whole there is a continuation of the long drawn out hesitation, prices are about where they were a week ago, and less eagerness is shown to sell. Quotations are as follows: Tank, 1.35c. to 1.40c., and Flange, 1.70c. to 1.80c. From store Tank is quoted 1.65c. to 1.80c., and Flange, 1.90c. to 2c.

**Merchant Pipe.**—Trading in Pipe has been limited to small lots, of which there are quite a number, with prices unchanged, as follows:

Sizes.	Black.	Galvanized.
¼ to ½ inch and 9 to 12 inches.....	61 2-10	48 2-10
¾ to 8 inches.....	66 2-10	53 2-10

**Sheets.**—Improvement is the general report, not a decided jump in demand, but one clearly noted. Both jobbers and manufacturers are buying. They are taking Sheets in moderately good sized lots for quick shipment. Prices seem to be reaching adjustment on a new basis. No. 27 Common is quoted 2.10c. to 2.20c., from store, and Galvanized is unchanged at 70 and 10 to 70 and 12½ per cent.

**Merchant Steel.**—Inquiries are gathering in number, and consumers show an increasing inclination to place fairly good orders for shipment during the next several months or for a year. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Tire, 1.80c. to 2c.; Open Hearth Spring Steel, 2.25c. to 2.50c.; Toe Calk, 2.50c. to 2.75c.; Sleigh Shoe, 1.75c. to 2c.; Cutter Shoes, 2.50c. to 2.75c.; Ordinary Tool Steel, 7c. to 7½c.; Special, 13c. and upward.

**Rails and Track Supplies.**—There is not much action in this market, though for Light Rails there is steady

inquiry in small lots. Nominally prices are as follows: Rails are \$35 to \$37 for Standard Sections, and \$29 to \$33 for Light Rails. Splice Bars, 1.50c. to 1.60c. Spikes are quoted 1.80c. to 1.90c.; Bolts, with Hexagon Nuts, 2.40c. to 2.50c.; Square Nuts, 2.30c. to 2.40c.

**Old Material.**—For Cast Scrap there is a steady inquiry, and a fair tonnage is moving to consumers, but for most grades the market has a holiday appearance. One consumer, whose Monday morning's mail usually includes about 75 offers of Scrap, had just three letters of that description last Monday morning. Railways are sending out the usual statements of Scrap offerings, and this trade goes largely to intermediate dealers. Not a few small dealers are holding back stocks. It is a very dull market, with prices slightly settling. The following are approximate quotations per gross ton:

Old Iron Rails.....	\$12.50 to \$13.00
Old Steel Rails, mixed lengths.....	9.50 to 10.00
Old Steel Rails, long lengths.....	10.50 to 11.00
Relaying Rails.....	18.00 to 18.50
Old Car Wheels.....	15.00 to 15.50
Heavy Melting Steel Scrap.....	9.00 to 10.00
Mixed Steel.....	8.00 to 9.00
Iron Fish Plates.....	11.50 to 12.00
Steel or mixed do.....	10.00 to 11.00
Iron Car Axles.....	15.00 to 15.50
Steel Car Axles.....	14.00 to 14.50
No. 1 Railroad Wrought.....	11.50 to 12.00
No. 2 Railroad Wrought.....	10.00 to 10.50
Shafting, Iron and Soft Steel.....	15.00 to 16.00
No. 1 Wrought.....	9.00 to 9.50
No. 1 Country Wrought.....	8.00 to 8.50
No. 1 Mill.....	7.00 to 7.50
No. 2 Mill.....	5.50 to 6.00
No. 1 Busheling.....	8.00 to 8.50
No. 2 Busheling.....	7.00 to 7.50
Iron Car Axle Turnings.....	8.00 to 8.50
Soft Steel Axle Turnings.....	7.00 to 8.00
Machine Shop Turnings.....	6.50 to 7.00
Wrought Drillings.....	6.00 to 6.50
Cast Borings.....	4.00 to 4.50
Mixed Borings and Turnings.....	4.00 to 5.00
No. 1 Boilers, cut.....	8.50 to 9.00
No. 2 Boilers, cut.....	6.00 to 6.50
Boiler and Ship Scrap.....	8.00 to 8.50
No. 1 Cast.....	10.00 to 11.00
No. 2 Cast.....	7.00 to 8.00
Railroad Malleable Cast.....	10.00 to 10.50
Agricultural Malleable Cast.....	9.00 to 9.50

**Metals.**—Copper is both more active and higher at about 16½c. for Lake and 16½c. for Casting. Lead is quiet at 4.20c. for Desilverized, and 4.30c. for Corroding.

A. M. Crane, former general sales agent of the Illinois Steel Company and latterly assistant to the chairman of the American Steel & Wire Company, has formed a partnership with W. A. Green, recently treasurer of the American Steel & Wire Company, under the style of A. M. Crane & Co. They have opened an office in room 573 The Rookery, Chicago, for the sale of Pig Iron, Steel and Railway Supplies.

## Philadelphia.

Office of The Iron Age, Forrest Building, {  
PHILADELPHIA, PA., August 7, 1900. }

It is no easy matter to write a satisfactory report of the Iron market under present conditions. If there was anything like uniformity it would be less difficult, but with some articles at the lowest figures on record, and others at 40 to 60 per cent. above the normal, it is impossible to form any very definite opinions in regard to the future. The present is, in fact, a mass of intricacies, some quoting one price, others something entirely different, besides which the various markets appear to be acting independently and are not influenced by anything outside of their own immediate circles. In this vicinity, however, there is hardly any change from last week. The feeling is a little better, and more business is being done, but confidence in regard to the future is not as fully established as people think it ought to be. Some bids are being made for material to be delivered from three to six months later on, and sales to a moderate extent have been made on this basis, but as a rule 60 to 90 days is as far as buyers care to go. Sellers are not crowding the market as much as they were some time since, so that while there is no change in prices, and no unusual activity, there is an undertone of strength which is in pleasing contrast with the pessimistic feeling of the past several months. The situation is very sensitive nevertheless, so that developments during the next two or three weeks will be scanned with unusual interest, as it is believed that they will indicate the course of the market for some time to come.

**Pig Iron.**—Practically the Pig Iron situation is about the same as it was a week ago. It may be a little better, not sufficiently so to warrant very strong assertions, but it is certainly not losing anything, and if not gaining, is at least holding its own. A considerable amount of business has been done during the week, including some large lots of Pipe Iron at about \$14, delivered; No. 2 Plain at \$16, and No. 2 X Foundry at \$16.50 to \$17, and for spe-

cial brands more than \$17 has been paid for the last mentioned grade. There is also a good deal of inquiry from the West for Malleable Irons, in some cases 5000 and 10,000 ton lots are asked for, and could probably be closed if the right kind of Iron and the right kind of deliveries could be guaranteed. There is no difficulty in buying Iron at the prices named, however, and if the brand desired cannot be had there are plenty of others, it is simply a question of being suited, but the supply is not excessive, and the pressure to sell is much less than it was some time ago, which no doubt accounts for the steadier feeling all around. There is nothing in the outlook to indicate any material change in the near future, so that business is being done at about the following figures for city or nearby deliveries: No. 1 X Foundry, \$17.50 to \$18; No. 2 X Foundry, \$16.25 to \$17; No. 2 Plain, \$15.75 to \$16; Mill Irons, \$14.50 to \$15; Ordinary, \$14 to \$14.50.

**Billets.**—Small lots are changing hands at prices varying from \$20.50 to \$21, but on 1000-ton lots and upward there is little doubt that the inside figure could be shaded.

**Plates.**—The demand shows steady improvement, and orders for 500 and 1000 ton lots are not nearly as scarce as they were during the two or three months immediately preceding. Bridge shops, shipyards and boiler shops are good buyers, the tonnage entered during the past week being quite considerable. There are no particularly large lots on the market at the present time, but the indications are favorable for a continued good demand from the small trade, which in the aggregate amounts to a large tonnage. Some of the mills are running full, and are taking in enough business to make them feel very confident of their position during the remainder of the year. Prices steady at about the following figures for the general run of orders: Plates,  $\frac{1}{4}$ -inch and thicker, 1.30c. to 1.35c.; Universals, 1.35c. to 1.40c.; Shell, 1.50c. to 1.55c.; Flange, 1.60c. to 1.65c.; Charcoal Iron Plates, C. H. No. 1, 2.40c.; Best Flange, 2.90c.; Fire Box, 3.40c.

**Structural Material.**—A good many bridge orders are being taken, so that the mills are likely to have plenty of work during the remainder of the year, besides which the shipyards will require quite a large tonnage. There is no change in combination prices, but it is said that lower figures are being quoted on small sizes by some outside interests. Nominal prices remain as follows for seaboard and nearby points: Beams and Channels, 15-inch and under, 2.03c.; Angles, 3 to 6 inches, 1.93c.

**Bars.**—The demand is improving considerably, and mills are now running pretty full time, with prospects of quite a large business during the next two or three months. Some export business is being done, but with such a liberal margin as there appears to be between this and European markets, the amount taken is not what might have been expected, but it may come later on, as there are still a good many inquiries in the market. Prices are well maintained, and in view of the low prices reported in the West it is quite encouraging to find free buying at last week's prices, say 1.25c. to 1.35c., delivered, for Best Refined Bars, and 10c. to 15c. below that for Steel Bars.

**Sheets.**—The situation shows no change, the demand for Thin Sheets being quite active, other descriptions inclined to drag. Mills are running as full as they can, considering the hot weather, the product being well taken at prices recently ruling—viz., for best Sheets (Common Sheets two-tenths less): No. 10, 2.30c.; No. 14, 2.40c.; No. 16, 2.50c.; Nos. 18-20, 3c.; Nos. 21-24, 3.10c.; Nos. 26, 27, 3.20c.; No. 28, 3.30c.

**Old Material.**—There is a better demand, and while sales are not numerous or large, there would be no difficulty in making them at prices which would have been gladly accepted a week or two ago. Bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, \$13.50 to \$14.50; No. 1 Yard Scrap, \$11 to \$12; No. 2 Light Scrap, \$10 to \$10.50; Machinery Cast, \$13 to \$14; Heavy Steel Scrap, \$10.50 to \$11.50; Old Iron Rails, \$14 to \$15; Old Steel Rails, \$13 to \$14; Wrought Turnings, \$8.50 to \$9; Cast Borings, \$6.75 to \$7.25; Old Car Wheels, \$17 to \$18; Iron Axles, \$15 to \$16; Steel Axles, \$16 to \$17.

At Pittsburgh, the Central District Printing & Telegraph Company have commenced work on a ten-story steel frame office building, to be located at the corner of Cherry alley and Fourth avenue. The plans for this new building show a handsome structure, with the first three stories faced with cut stone and the rest of the floors faced with red brick and terra cotta trimmings. Another large steel frame building, which the same company are to put up at once, will form an addition to the present Central Exchange on Seventh avenue, known as the Telephone Building.

## Cleveland.

CLEVELAND, OHIO, August 7, 1900.

**Iron Ore.**—*Lake Freights.*—Since the shippers received notice from the mine operators in the Lake Superior district to stop sending so much Iron Ore down the lakes by wild tonnage the market has been getting weaker and weaker, and this week the rates broke of their own weight. The movement from Duluth has been conspicuously light, and when a shipper had a cargo which he wished carried down the lakes he was able to dictate the rates. Whereas Ore has been carried at not less than \$1 hitherto, it has now dropped to 90c. The market has been so weak that it did not require any concerted action on the part of the shippers, but the individuals broke the rate simply because they happened to want to send a single cargo or so down the lakes. The other ports were not touched for a day or so after the Duluth break, but when any Ore was to be moved from Marquette it was brought down the lakes at a rate commensurate with the freights from the head of the lakes, which means that Marquette is now paying 80c. for the transportation of her wild cargoes of Ore. The freights out of Escanaba have not changed, but all realize that it is but a matter of time until this port will also be lined up according to the reductions. Even at the lower rates no increased amount of Ore is being brought down the lakes, showing, therefore, that the shippers are not necessarily waiting on any lower rates but are holding off because they have no Ore to bring down by wild tonnage. Such a condition does not speak well for the success of the Rockefeller movement to maintain the lake rates by placing his boats in ordinary. In some quarters it has been conceded that Rockefeller has already lost his deal, and is now withholding his boats from the general lake trade because there is nothing for them to do.

**Ore Movement.**—The movement of Iron Ore down the lakes and away from the stock piles to the furnaces continues light. All of the boats which were contracted with last summer are being kept busy, none of them having any trouble to get their cargoes as soon as they get into port, but there is no great rush about it. The Ore moved already this year is in excess of what it was a year ago, but this will necessitate that from now on it shall be lighter because the prospects are for a demand for about as much Ore this year as was used last year. This promises that wild Ore boats will not be running back and forth until Christmas, even should the weather permit of it, as they did a year ago.

**Sales of Ore.**—Sales agents speak of but little business being done. For a short time following the fixing of the prices of Ore for the last half of this year the furnacemen showed an increased interest in future business and commenced making inquiries. This was due to the fact that inquiries for Pig Iron were heavier than they had been. It seems now that there has been a lull in both Pig Iron and Iron Ore. There have been no sales of Bessemer Ore and seemingly no demand for it. For the Mesabi Ores there is a slight demand and a few sales are being made, but these are not fulfilling the promise of a week ago. No attempt has been made to break the agreed prices on Ores, the market being strong.

**Bessemer Pig.**—A meeting of the Bessemer Association was held in this city last week, for the purpose of deciding what steps should be taken to offset the great surplus that is being accumulated. It was agreed that after September 1 all of the Bessemer furnaces should go out of blast for an indefinite length of time, or until the surplus had been sold out and the demands of the market make it urgent that the furnaces shall be blown in. There was no agreement to that effect, according to the statement of those present, but each individual furnaceman asserted it to be his intention to close the furnaces. There are but two exceptions. These are the Briar Hill and the Andrews-Hitchcock furnaces at Youngstown. The Briar Hill will make Bessemer for two concerns especially and the Andrews-Hitchcock assert that their furnace is to be turned to making Foundry Irons. As to Bessemer Pig Iron, there have been practically no sales for months. The Bessemer people say that no reduction of prices would bring out the business, for it is not there to be done.

**Foundry Irons.**—This week has seen a little better demand for Foundry Irons for spot delivery. The conditions prevent any great amount of business being done, but for the foundries which are open the business is brisk. The sales of Pig Iron are confined almost entirely to the Gray Iron foundries, because most of those making machine castings are still shut down, owing to the molders' strike. There are a few demands for Iron for the latter half of this year, but these are very light. The business in that direction does not seem to have commenced to move as yet. The Pig Iron men are quoting \$16 to \$16.50 on Nos. 1 and 2 Foundry, Cleveland.



**Finished Materials.**—Ohio has now caught the spirit that was shown by Illinois two weeks ago, and the buyers are taking care of their needs for the last half of this year and, in many instances, for the first half of next year. The heaviest business is in agricultural work. The demands of the buyers have been heavy and the sales have corresponded. In fact, the agricultural business may be said to have been the main feature of the market. The sales have been ever so heavy, but were made at the low prices now prevailing. In some instances it is believed that the low prices are responsible for the amount of stuff sold. The buyers have realized that the prices of some articles must go up and in consequence are taking advantage of the market while it stands as it does now. This is going to compel some of the furnaces to do almost all of their next year's business at rock bottom prices, and in some instances the prices now being quoted are below the present cost of production. Such being the case an effort to decrease the cost of production may be expected.

**Bars.**—Some of the small mills have contracted up to the limit of their capacity for the next year at 1c. At the present status of wages and other expenses in producing Steel this is below cost. This week has seen 1000 tons of Bars sold to the Upson Nut Company, with two more sales aggregating 900 tons.

**Plates.**—Plates are being quoted now by the standard mills at 1.15c., although some prices have been lower than that. The market is stiffer than that on Bars, which was not the case a few weeks ago, when the converse was true. The sales this week have been heavy, a good deal of business being done for the last half of the year and some sales even further in advance being made.

**Beams and Channels.**—Not much has been done in Structural Steels this week, owing to an under current of belief that the prices must soon come down. In some well informed quarters it is predicted that a break will be seen before the week ends. A big business in Structural Steels is yet to be done, but the buyers appear to be waiting the decline of which they are confident. The market knows of 800 tons in one lot that is waiting for a lower price, which it is believed will be accorded soon.

**Billets.**—Some slight demand for Billets has presented itself this week, although the business is nothing of which to boast. The levelling of prices has brought the market quotation on Billets down to \$18, and it might be said that the market is fairly strong at that figure.

## Cincinnati. (By Telegraph.)

Office of The Iron Age, Fifth and Main streets, }  
CINCINNATI, August 8, 1900. }

In spite of further concessions, or it might be said on account of them, there has been no business of any consequence transacted in the Pig Iron Market during the past week. What buying there has been was strictly on the line of daily necessities. There are quite a number of buyers talking trade, but in spite of their needs their fear of lower prices keeps them from closing contracts. While furnaces generally are quite willing to sell for prompt delivery at present quotations, many of them are refusing to consider long time contracts on that basis. There has been a very heavy slump in Coke and quotations are being made at \$2.40 at the West Virginia ovens. The demand from furnaces has fallen off and from this circumstance it is being figured out that the immediate reduction in Pig Iron production will be a very material one. The outlook for the near future is not rosy and the tonnage sold this month will likely be small. Freight rate from Birmingham is \$3.25 to this point; from the Hanging Rock district \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1.....	\$15.50 to \$16.00
Southern Coke, No. 2.....	14.50 to 15.00
Southern Coke, No. 3.....	13.50 to 14.00
Southern Coke, No. 4.....	12.50 to 13.00
Southern Coke, No. 1 Soft.....	15.50 to 16.00
Southern Coke, No. 2 Soft.....	14.50 to 15.00
Southern Coke, Gray Forge.....	12.25 to 12.50
Southern Coke, Mottled.....	12.25 to 12.50
Ohio Silvery, No. 1.....	19.50 to 20.00
Ohio Silvery, No. 2.....	18.50 to 19.00
Lake Superior Coke, No. 1.....	16.00 to 17.00
Lake Superior Coke, No. 2.....	15.00 to 16.00
Lake Superior Coke, No. 3.....	14.50 to 15.00

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel, Chilling grades.....	\$22.50 to \$23.25
Standard Southern Car Wheel, No. 2.....	21.50 to 22.00
Lake Superior Car Wheel and Malleable.....	20.00 to 21.50

**Plates and Bars.**—There is a much better feeling than there was three weeks ago and the assertion is made that the bottom has at last been reached. Prices are no lower here and it may even be said are firmer at

last week's figures. We quote, f.o.b. Cincinnati: Iron Bars, carload lots, 1.60c., with half extras; in small lots, 2c., with full extras; Bar Steel, carload lots, 1.70c., with half extras; small lots, 2c., with full extras; Iron Bar Angles, 1½ x 3-16 inch and larger, in car lots, 1.75c.; small, 2.25c.; Sheets, No. 10, 2.25c.; No. 27, Steel, 3c.; Plates, 2c. to 2.25c.

**Old Material.**—The market is dull and unchanged. We quote dealers' buying prices per gross ton, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, \$11 to \$12; Cast Railroad and Machine Scrap, \$10 to \$11; Iron Axles, \$14 to \$15; Iron Rails, \$12 to \$13; Car Wheels, \$14 to \$15.

## Birmingham.

BIRMINGHAM, ALA., August 6, 1900.

The buying activity reported in the West the past week has not extended to this place and we have had a very dull and listless market. One of the largest interests here informed your correspondent that five cars would cover the orders they filled the past week. There were sales of No. 2 Foundry at \$12.50. Some sold at \$12.20, and it was finally offered at \$12. At this price some was sold, but the amount was quickly banked and access prohibited. Your correspondent has been suspicious of his quotations for some time past, but had no way of verifying them. But here is a revelation in the way of "an eye opener." Every month a committee from the miners in the employ of the Tennessee Company examine their books to ascertain the average selling price of Iron, for on this price is based the wages of the Coal miners. The committee finished their examination Friday and announced that the average sales price of Iron during the month of July was under \$11. That would make Gray Forge not a cent above \$10, and hardly that, and it would make No. 2 Foundry below \$12. But getting it at these figures now is a matter of grave doubt. The information of large purchases in the West has infused a stiffening of backbones and it is hoped that this buying movement is the vanguard of the army of buyers who have been waiting for the market to get down to bed rock prices. The feeling here is very strong that if we are not on bottom we are scraping it. At prevailing prices the profits are light and in some cases are nil. The cost of making Iron, labor, Ore, and other material has not been reduced, though the decline in it approximates \$6. More or less Iron, depending on grade, can be obtained now for prompt shipment, owing to the fact that so many buyers have repudiated their contracts. Some of them have done so on the flimsiest pretexts and among them are firms well rated in the commercial directories and enjoying good reputation and credit. The sellers are powerless to stamp out the evil as long as the selling conditions continue as they are at present. There is one thing sure—the evil has reduced a large legitimate profit to a profit on paper, and that kind of a profit means a material loss.

As for the export trade, there is no life in it so far as new trade is concerned. An insignificant amount was worked the past week. There have been good shipments, two train loads going out in one day last week over one road. The Tennessee Company are just concluding a shipment of 25,000 tons sold in April, and the Sloss Company are engaged on the same size order. There must be a good lot to go yet, for your correspondent has information that an order has been placed with one road for 600 cars to Atlantic ports. It can be mentioned as a matter of interest and as evidence that Birmingham products are being pushed to the front that in late shipments to Glasgow and Copenhagen a sample lot of Steel Billets and Ingots went to those respective ports.

One of the Ironton furnaces has gone out of blast, waiting for an Iron demand to spring up before starting again. The new furnace of the Tennessee Company at Ensley is now completed and ready for work and as soon as track connections are made will go to work. Next week will see it in operation. The Steel mill blew its whistle to-day, announcing resumption of work. Only part of the huge plant will be started—say three furnaces and the blooming mill train—and operations will be enlarged as demand prompts. The Bar, Rod and Wire Nail mill also resume operations and will have all their departments running. The Bessemer Rolling mill started the past week, employing about 700 men. Work at the Birmingham Rolling Mills is being pushed to a conclusion as fast as possible, and when concluded that will go to work. The improvements being placed there are in the nature of modernizing the plant as far as possible.

Some new Coal mines are being opened, notably on the new branch of the mineral road being constructed by the L. & N. R. R. In fact, there is so much work under way and being mapped out that it is hard to keep the run of it.

The Semet-Solvay Company have commenced work

on their addition to present works. The addition will cost \$500,000 and the most of this amount will be spent in the district.

When your correspondent says that during the year ending June 30 the aggregate of the capital invested in the district is fully \$10,000,000 he anticipates that more than one of your readers will shrug his shoulders and elevate his eyebrows, the sure signal of unbelief. But the statement is entirely conservative, and within the limits of truth. Some put it at \$11,000,000. During this time about 30 new industries have been organized and about 75 new companies have been formed, covering mining and manufacturing of various kinds. In Birmingham over 400 new buildings have been erected, while at Ensley and Pratt City there were respectively 500 and 300. There are now 40,000 men on the pay rolls in the district, and \$2,000,000 is paid out monthly to them. These are facts, and if signs count for anything we are certainly on the highway of prosperity.

Sol Haas returned from his leave of absence only to announce his resignation as president of the Sloss Iron & Steel Company. He announced to your correspondent that his resignation was a final retirement from the Iron trade. His health is such that all ideas of business are precluded and his efforts will be directed for some time to coax back his health. The employees of the company testified to the great esteem in which he was held by the presentation of handsome and costly presents. It is rumored here that a Mr. Hopkins of Evansville will succeed him.

## Pittsburgh.

Office of *The Iron Age*, Hamilton Building, 1  
PITTSBURGH, August 7, 1900. {

The Iron trade is showing improvement in the direction that there is a much better inquiry for Finished Material of nearly all kinds, and considerable tonnage is being placed, but at very low prices. We have already referred to the heavy tonnage in Steel Bars placed in the last two or three weeks, which may aggregate 200,000 tons or more. In Plates, Sheets, Pipes and Tubes and Skelp there is a good deal better inquiry, and more business is being placed than for several months. In Pig Iron and Steel the market continues dull with prices low, in some cases below cost of production. Bessemer Pig Iron has sold at \$15 at furnace and Malleable Bessemer at \$14.25. Bessemer Billets have been offered down to \$18 and \$18.50, maker's mill. With so many mills shut down at the present time and the low prices that are being made, it is expected that the mills that are running will be able to secure enough business to keep pretty well filled up. No movement has been made as yet by either side in the matter of fixing the Amalgamated scale for Bar mills. All the plants of the Republic Iron & Steel Company and of the union mills of the American Steel Hoop Company are idle, with no prospect of early resumption. A conference is being held in Pittsburgh to-day (Tuesday) on the Tin Plate scale, and it is probable that this scale will be arranged before the conference is ended.

**Pig Iron.**—There is a better inquiry for both Bessemer and Foundry Iron, and some sales are being made of small lots. We can also note a sale of 10,000 tons of Malleable Iron at a price equal to about \$14.25 at Valley furnace. This is an off Bessemer, running up to 0.18 in phosphorus. We can also note sales of Standard Bessemer Iron, running from 300 to 500 tons, at \$16, Pittsburgh, equal to \$15.10, Valley furnace. We also note a sale of Standard Forge Iron at \$14, Pittsburgh. This Iron, however, did not come from the Valley. We also note that local No. 2 Foundry Iron is being offered at \$14.75 to \$15, at furnace, equal to about \$15.50 to \$15.75, Pittsburgh. We quote Standard Bessemer Iron at \$16 in small lots; Forge Iron at \$14, and No. 2 Foundry at \$15.50 to \$15.75, all f.o.b. Pittsburgh.

**Billets.**—There is a better inquiry for Steel, and several sales of small lots are reported on the basis of \$18 to \$18.50, maker's mill. It is reported that a leading consumer is negotiating for a round lot of Billets for delivery extending over the balance of the year and into first part of next year. Basic Open Hearth Billets from 0.10 to 0.12 carbon are quoted at \$20 to \$21, maker's mill, and up to \$23 and \$24 for 0.45 to 0.50 carbon.

**Sheet Bars.**—We do not hear of any recent sales. Long Bars are quoted at \$21 to \$22, and Light Bars, cut to length, are quoted at about \$23, Pittsburgh.

**Ferromanganese.**—We continue to quote 80 per cent. Ferromanganese at \$85 in lots of 50 tons or over, and \$100 in small lots, delivered at buyer's mill. A sale of 25 tons is reported at \$100, delivered.

**Structural Material.**—The contract for the extension to the Laughlin Works of the American Tin Plate Company, at Martin's Ferry, Ohio, has been taken by Ameri-

can Bridge Company. About 1025 tons of Shapes are involved. There is a good inquiry for Structural Material, consisting of small jobs, which aggregate a large tonnage. The mills rolling Shapes are all pretty well filled up. We quote: Beams and Channels up to 15-inch at 1.90c.; over 15-inch, 2c.; Angles, 3 to 6 inch, inclusive, 1.80c.; over 6-inch, 1.90c.; under 3-inch, 1.60c. to 1.70c.; Zees, 1.90c.; Tees, 1.95c.; Bars, 1.05c. to 1.10c.; Universal and Sheared Plates, 1.10c. to 1.15c., all f.o.b. Pittsburgh.

**Plates.**—There is more inquiry for Plates, and while prices have not absolutely advanced, the tone of the market is stronger, one or two of the leading mills having taken a good deal of tonnage in the past two weeks, and are firmer in their ideas as to prices. The general market on Sheared Plates, ¼-inch and heavier, is 1.10c. to 1.15c., at mill. For very desirable tonnage and early delivery it is possible our lower price might be slightly shaded by some mills. We quote Shell at 1.20c.; Flange, 1.30c.; Fire Box, 2.25c. to 3c.

**Merchant Steel.**—A better demand is reported and more tonnage is being placed than for some time. Prices continue low and for good orders our quotations would probably be materially shaded. We quote: Tire Steel, 1.75c. to 1.80c.; Toe Calk, 1.85c. to 1.90c.; Open Hearth Basic, 2.25c. to 2.35c.; Plow Slabs, 1.80c. to 1.90c.; Rolled Lay Steel, 2.75c.; Hammered Lay Steel, 3.10c. to 3.25c.; Tool Steel, ordinary grades, 7c. and upward, depending on quality. Terms are 60 days, 2 per cent. off for cash in 10 days, and on Tool Steel 25c. freight is allowed.

**Sheets.**—For the first time in some weeks we can note a better inquiry for Sheets, and a good deal of tonnage is being placed, particularly for Corrugated and Galvanized. There is wide range in prices, No. 28 being quoted in some cases below 3c. and up to 3.20c. The general market on No. 28, one pass, is 2.90c. to 3c. It is intimated that in special cases the lower price has been shaded. We quote Galvanized Sheets at 70 and 10 and 2½ per cent., 15c. freight.

**Bars.**—Most of the large contracts for Steel Bars have been placed, and some of the mills that have as many cheap Bars on their books as they care to have have advanced their prices \$2 a ton or more. There are still several large consumers of Bars that have not covered, and their inquiries are still in the market. The general market on Steel Bars is 1.05c. to 1.10c., but as noted last week, for a very desirable specification, and prompt shipment, it is possible that 1c. at mill could be done. Nearly all the mills rolling Iron Bars are idle, and if this condition continues a slight reaction in prices is not unlikely. We continue to quote Iron Bars at 1.25c. to 1.30c., Pittsburgh. Our quotations on Iron and Steel Bars carry half extras. Owing to the wide difference in price of Steel and Iron Bars a good many consumers of Iron have gone back to Steel.

**Skelp.**—There is a better inquiry for Skelp, and some tonnage is being placed, but at very low prices. We quote Grooved and Sheared Skelp at 1.25c. at mill, but for Bessemer stock, ordinary sizes, it is probable this price could be shaded.

**Pipes and Tubes.**—There is a good deal more inquiry for Tubular Goods, especially Boiler Tubes, and a good deal of tonnage is being placed. Several large contracts for Line Pipe have recently been taken by the leading interest. Outside mills continue to make concessions in prices. Quotations to consumers in carload lots are as follows:

Merchant Pipe.		
	Black. Per cent.	Galvd. Per cent.
1/4 to 1/2 inch and 11 and 12 inch.....	63	50 1/2
3/4 to 10 inch.....	70 1/2	58
Casting.		
	S. & S. Per cent.	
2 to 2 3/4 inch.....	42	
3 to 4 1/4 and 7 1/2 to 12 1/2 inch.....	56	
4 3/4 to 7 1/4 inch.....	60	
Boiler Tubes.		
	Up to 22 feet. Per cent.	22 feet and over. Per cent.
Steel.		
1 inch to 1 1/2 inch and 2 1/2 inch.....	50	45
1 3/4 to 2 1/4 inch.....	42	36
2 3/4 to 13 inch.....	55	50
Iron.		
1 inch to 1 1/2 inch and 2 1/2 inch.....	45	40
1 3/4 inch to 2 1/4 inch.....	40	34
2 3/4 inch to 13 inch.....	52 1/2	47 1/2

To jobbers, prices are about 5 per cent. lower than the above.

**Coke.**—Production of Coke in the Connellsville region is still falling off, and will continue to do so until there is an improvement in the Iron trade. Last week out of 20,420 ovens in the region, 15,930 were active and 4490 idle, the output having been 160,091 tons, a decrease over the previous week of 5377 tons. Rainey plant, of W. J. Rainey Company, is now idle. Acme, of the Acme Coke Company, have only 20 out of 60 ovens in blast. Forty ovens at the Empire works of the Bessemer Coke Com-



pany were started up. There is not much new business being placed in either Furnace or Foundry Coke, but there is perhaps a little better inquiry for the latter than there was some time ago. We continue to quote strictly Connellsville Furnace Coke at \$2, 72-hour Foundry Coke at \$2.75, and Crushed Coke at \$3 to \$3.25, all in tons of 2000 pounds f.o.b. at oven. Main Line Coke—that is, Coke produced outside the Connellsville region—is being offered at less than the above prices.

## New York.

Office of *The Iron Age*, 232-238 William street, }  
NEW YORK, August 8, 1900. }

**Pig Iron.**—There has been a little more business, and from foreign markets in particular come numerous inquiries, which have led to some sales. The latest is one lot of 1000 tons of Gray Forge for Manchester delivery. Freight continues high, and from \$4.50 to \$5 is asked from Alabama to foreign ports. Quotations are as follows at tidewater: Lehigh, Schuylkill and Virginia Irons, No. 1, \$17 to \$18; No. 2 X, \$16 to \$17; No. 2 Plain, \$15 to \$16; Gray Forge, \$14 to \$15. Tennessee and Alabama brands, No. 1 Foundry, \$17.50 to \$18; No. 2 Foundry, \$16.25 to \$16.75; No. 1 Soft, \$17.50 to \$18; No. 2 Soft, \$16.25 to \$16.75; No. 3 Foundry, \$15 to \$15.50; No. 4 Foundry, \$14 to \$14.25; Gray Forge, \$13.75 to \$14.25.

**Cast Iron Pipe.**—The consolidated company have taken the Boston order for about 900 tons, at a low figure. Generally speaking, the competition between the consolidation and the outside shops is very sharp, and the invasion of territory is general. Eastern shops have taken good orders in the Central West and in the Northwest. The result is that the market is very irregular. It is noted, however, that the tonnage in the shape of small orders is increasing. We quote \$26.50 to \$27.50 per gross ton of small lots of 8-inch Pipe at tidewater, but in larger contracts lower figures are made.

**Steel Rails.**—The market is very dull and entirely nominal at \$35 at Eastern mill. We quote Track Material nominally 2c. to 2.10c. for Spikes, 2c. to 2.10c. for Splice Bars, 3c. to 3.10c. for Square, and 3.10c. to 3.20c. for Hexagon Bolts.

**Finished Iron and Steel.**—A meeting of the Structural Steel Association was held in this city to-day, at which present prices for Beams, &c., were reaffirmed, no reduction being considered desirable or necessary. The American Bridge Company have secured the contract for the erection of 35 spans for two lines in Japan, involving a fair tonnage. Another order for the same country seems to have gone abroad. The elevated road is in the market for a small amount of Structural Material for power houses. Plates continue easy. We quote as follows at tidewater: Beams, Channels and Zees, 2.05c. to 2.15c.; Angles, 1.95c. to 2.05c.; Tees, 2.10c. to 2.20c.; Bulb Angles and Deck Beams, 2.35c. to 2.45c.; Universal Mill Plates, 1.30c. to 1.40c. Sheared Steel Plates are 1.25c. to 1.40c. for Tank, 1.40c. to 1.50c. for Shell, 1.50c. to 1.70c. for Flange, 2.10c. to 2.30c. for Fire Box, 3.50c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1, 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.35c. to 1.40c.; Common Bars, 1.25c. to 1.35c.; Soft Steel Bars, 1.15c. to 1.30c., and Hoops, 2c. to 2.25c., base, on dock.

**Old Material.**—Transactions are limited in number, although the offerings are quite heavy. We note a sale of 400 tons of choice Scrap at a low figure. A lot of 8000 tons of Plate Scrap, from a fire, is now on the market. Shippers of Old Material for the Mediterranean markets are having trouble in securing freight room, the movement of American coal for the ports in question being very heavy.

The Western Tube Company have opened an office in New York City, located in room 715 Park Row Building, under the management of J. C. Williams.

## Metal Market.

Office of *The Iron Age*, 232-238 William street, }  
NEW YORK, August 8, 1900. }

**Pig Tin.**—The market is very quiet, and prices are declining. Demand from the interior is said to be extremely small. Closing quotations to-day are 31.65c. to 31.95c. for spot, 31.55c. to 31.70c. for August, and 30.87½c. to 31.15c. for September. London closed easy to-day at £144 for spot and £136 10s. for futures. Arrivals here during the week amounted to 1100 tons, and it is said that a good portion of this amount will go into store.

The Pig Tin statistics for July, as compiled by Charles S. Trench & Co., are as follows:

	Tons.
Estimated stocks on spot, New York, Philadelphia and Boston, July 1.....	1,360
Actual arrivals during July, New York, Philadelphia and Boston .....	1,657
Total.....	3,017
Estimated consumption during July.....	2,000 tons.
Reshipped to England during July.....	80 tons.
	2,080

Estimated stocks on spot, New York, Philadelphia and Boston, August 1.....	937
Actual afloat from East Indies, shipments to August 1....	2,415
Actual afloat from London, shipments to August 1.....	1,100
Total visible United States stocks, spot and afloat....	4,452

**Copper.**—There is practically no change in the situation. Business in spot is very slight owing to scarcity of spot Copper, and in futures consumers do not seem to be willing to engage. Spot Lake is held at 16½c., while quotations in Electrolytic run from 16½c. to 16½c. Exports during last week were large, but thus far this week they have been small. The total exports since the first of this month amount to about 3800 tons. London closed easy to-day at £73 15s. for spot and £74 for three months' futures. The decline in spot amounts to 5 shillings since last week. Best Selected is quoted £78 10s.

**Pig Lead.**—Prices here are unchanged. It is reported that the demand has increased slightly. Large concerns are said to be stocking up in anticipation of a good fall trade. The American Smelting & Refining Company are quoting 4.25c., New York, and 4.20c. St. Louis. London has declined to £17 15s., a drop of 5 shillings since last week.

**Spelter.**—No new features have presented themselves and the market remains dull, with slightly lower prices. The ordinary brands are quoted 4.20c. here to-day. The choice high grade brands remain unchanged at 4.50c. London has declined 5 shillings and comes to-day £19 5s. It is said that the options which were held by certain parties on a number of Western smelting plants expired on the first of this month, but were renewed for 60 days. The opinion of the trade is that the promoters will fail to carry through their consolidation scheme.

**Antimony.**—Is unchanged. Hallett's is quoted 9½c. and Cookson's 10½c.

**Nickel.**—Continues strong and unchanged. It is impossible to obtain large lots and small quantities are bringing from 55c. to 60c.

**Quicksilver.**—Wholesale lots of 50 flasks and more are quoted \$51 per flask of 76½ lbs. London has declined 5 shillings and is quoted £9 5s. to-day.

**Tin Plate.**—The mills are still closed and consequently consumers are being supplied out of stock. In a few lines the stock has been exhausted, but as there is no buying for the future the producers and consumers are getting along very well together. The increased number of purchases indicate that consumers are fairly busy. The American Tin Plate Company are still quoting on a basis of \$4.84 per box of 100-lb. Cokes, f.o.b. New York, or \$4.65, f.o.b. mills.

## St. Louis. (By Telegraph.)

Office of *The Iron Age*, 1205 Chemical Building, }  
St. Louis, August 8, 1900. }

**Pig Iron.**—Tonnage sales within a week may be reported as showing a slightly brighter state of the market. A fair amount of car lot orders have been entered. One notable transaction was closed for 600 tons Eastern Basic Iron. It is proper to say that the Iron was all bought for actual requirements. Efforts to interest consumers for their future needs in more than one instance have proven fruitless. Although in many cases foundrymen admit that present prices seem very tempting, they are not willing to confirm that opinion by giving an order. Purchasers are inclined to wait until the bottom of the stock pile is being uncovered. Quotations herewith are lower than those of last week, but they are not participated in by all producers. We quote, f.o.b. St. Louis:

Southern, No. 1 Foundry.....	\$16.75 to \$17.00
Southern, No. 2 Foundry.....	15.75 to 16.00
Southern, No. 3 Foundry.....	14.75 to 15.00
No. 1 Soft.....	16.75 to 17.00
No. 2 Soft.....	15.75 to 16.00
Gray Forge.....	13.75 to 14.00

**Bars.**—More interest has been shown and mill representatives report an improved volume of orders. Because of many of the mills being closed pending adjustment of the wage scale jobbers are unable to replenish their stocks as freely as heretofore. Jobbers' and mill stocks are said to be going off rapidly. For desirable tonnage only mills quote Steel Bars at 1.30c. and Iron 1.40c., base,

half extras. Jobbers quote 1.75c. for Iron and 1.90c., base, for Steel, full extras.

**Rails and Track Supplies.**—The weather is favorable to track improvements and considerable work is being prosecuted. We quote Splice Bars, 1.90c.; Track Bolts, with Square Nuts, 2.50c.; with Hexagon Nuts, 2.70c.; Spikes, 2c.; Links and Pins, 2c.

**Pig Lead.**—Since our last report an advance of  $\frac{1}{4}$ c. was made in price of Desilverized. It is quoted to-day at 4.20c., and Soft Missouri at 4.15c. But little buying was done on the advance. Users are said to have no confidence in the maintenance of the prices and are not buying beyond needs. The advance seems ill-timed, as the volume of purchases has been very small lately. Lead Ore sold at a higher figure and brought \$47 per ton.

**Spelter.**—Very little movement and quotably unchanged at 4c. to 4.05c. The top price for Zinc Ore was also stationary at \$28 per ton.

## The British Iron Market.

**Summary.**—The improvement in the Pig Iron situation continues and the outlook is encouraging, especially in the Cleveland district. The tone is more buoyant, stocks are small and there is every prospect of some revival of activity in buying. In regard to the warrant markets there has been a decline in Glasgow, but in Middlesbrough the tone has been steady. In the Manufactured Iron and Steel trade reductions are reported from Scotland and from the Cleveland district. Otherwise the position presents few new features. The engineering trades remain fairly occupied, although new business is still far from plentiful, and in the shipbuilding industry some new contracts are reported to have been given out. American advices report an improvement as far as Pig Iron is concerned, as a result of decreased production. Large sales for Europe are reported by our correspondent. Steel is again lower, Billets being quoted at \$20. On the Continent the situation shows little change.

**Pig Iron.**—The Pig Iron trade is more satisfactory in the Cleveland district and makers are looking forward to the immediate future with confidence, anticipating an early increase in prices, the general position being much more favorable to an upward movement than is usual at the present season of the year. Makers are uninfluenced by warrant fluctuations and continue to adhere strongly to their full rates, No. 3 G. M. B. being quoted at 69 shillings. This quality is extremely scarce; it is almost impossible to get any for early delivery. The end of the strike at Rotterdam will have a favorable effect on shipments, and already they are looking up. In Glasgow there has been very little business doing in warrants, which have fallen away since our last to 70 shillings 11 pence, as against 72 shillings 6 pence a week ago. The South Staffordshire market remains steady. The current output is readily taken up and there is every prospect of these conditions prevailing for some time to come. Prices are well maintained.

**Manufactured Iron and Steel.**—The position in the finished branches of the Iron and Steel trades continues fairly steady, on the whole, although reductions are reported from Scotland and from Middlesbrough. Cleveland Iron Ship Plates, which last week stood at £8 10s. to £8 12s. 6d., are now quoted at £8 to £8 2s. 6d., a fall of 10 shillings per ton, while Iron Girder Plates have been reduced 5 shillings, the figures now being £8 7s. 6d. to £8 10s., as against £8 12s. 6d. to £8 15s. a week ago. Steel Ship Plates have also been put down, their present quotation—£8 to £8 2s. 6d.—being 7 shillings 6 pence below our last prices, which were £8 7s. 6d. to £8 10s. The West of Scotland makers have reduced Bar Iron 10 shillings per ton. Most of the works across the border reopen next week, and some have already resumed business, manufacturers having recognized that they are unable to bring down the price of Pig Iron or of Coal by any temporary suspension of operations. The reductions which have taken place in Middlesbrough and Glasgow have not been followed by more in other centers, and in South Staffordshire and elsewhere makers are apparently experiencing a tolerably steady demand, while they have little difficulty in resisting the attempts of consumers to get orders accepted at lower terms. Mr. Waterhouse's report for the two months ended June 30 is satisfactory, showing as it does the average price of Manufactured Iron in the North of England to be £8 0s. 1.96d., as against £7 13s. 5.67d. in the previous two months. This advance carries with it an increase of wages of 3 pence per ton on puddling and 21 per cent. on all other forge and mill work. The Midland Wages Board at their meeting yesterday reported the average selling price as £9 15s. 5d., as against £9 6s. 6d.

**Engineering and Shipbuilding.**—In most sections of

the engineering trade activity is maintained, with new work coming forward fairly well, this being especially the case in connection with all descriptions of railway rolling plant and material, while machine tool makers are also not only continuing fully engaged, but securing a very fair weight of new work. Taking the position all through, however, the outlook is not altogether satisfactory. Boiler makers, although still busy with orders on their books, are not getting new work equal in quantity to that which is running out. In general constructive work there is also less doing, and all through the textile machinery industries some slackening off is reported. There is little fresh to report in regard to the shipbuilding industry.

**Comparison of Prices.**—The annexed table shows the current prices compared with those of last week and of the corresponding period of last year:

	July 26, 1900.	July 19, 1900.	July 27, 1899.
	s. d.	s. d.	s. d.
Iron Ore—			
Rubio, Middlesbrough ...	21 0	21 6	17 0
Rubio, Cardiff ...	20 6	20 6	15 9
Pottery Mine, North Staffordshire.	20 6	20 6	14 6
Hematite, West Coast (at mines)...	17 6	17 6	16 0
Pig Iron—			
No. 3 Foundry, Middlesbrough ....	69 0	69 0	74 0
Warrants ...	...	68-3*	74 3
Scotch Warrants, Glasgow ...	70 11	72 6	74 2
Hematite Warrants, West Coast ...	83 4	83 4	79 6½
Cold Blast (Foundry), South Staffordshire ...	130 0	130 0	110 0
Welsh Hematite, Cardiff ...	84 0	84 0	80 0
Manufactured Iron and Steel—	£ s. d.	£ s. d.	£ s. d.
Marked Bars, South Staffordshire	11 10 0	11 10 0	9 0 0
Common Bars ...	10 15 0	10 15 0	8 0 0
Steel Rails, Middlesbrough ...	7 10 0	7 12 6	6 7 6
Steel Rails, West Coast ...	7 5 0	7 7 6	6 5 0
Steel Rails, Cardiff ...	7 5 0	7 5 0	6 5 0
Steel Angles (eng.), Middlesbrough	8 12 6	8 15 0	7 2 6
Steel Angles (eng.), Glasgow	8 5 0	8 5 0	7 0 0
Steel Plates (ship), Middlesbrough	8 0 0	8 7 6	7 10 0
Steel Plates (ship), Glasgow ...	8 2 6	8 7 6	7 10 0
Tin Plates, Bessemer IC Cokes, South Wales ...	s. d.	s. d.	s. d.
	15 3	15 6	16 0

\* Buyers, one month.

## PERSONAL.

Judge Gary, president of the Federal Steel Company, has gone to the Pacific Coast.

The Chicago Pneumatic Tool Company have engaged Fred. F. Bennett as sales agent and manager of advertising, with headquarters at the main office of the company, Monadnock Block, Chicago. Mr. Bennett resigned a position as sales agent for the American Steel Casting Company and American Coupler Company of Chester, Pa., the change taking effect July 1. Mr. Bennett's apprenticeship of several years was served on the Chicago daily papers as reporter and city editor, and later he was city editor of the Omaha Republican. Subsequent to this he was for many years Western representative of the Railroad Gazette of New York.

J. V. W. Reynnders, superintendent of the bridge and construction department of the Pennsylvania Steel Company, Steelton, Pa., is expected back from Europe at an early date.

Joseph S. Neave, vice-president of the Bullock Electric Mfg. Company of Cincinnati, has sailed for Europe.

Geo. A. Cragin has been appointed assistant general sales agent of the American Steel & Wire Company at Chicago, to succeed Geo. H. Ismon, transferred to San Francisco.

Lawrence C. Phipps of the Carnegie Steel Company, Pittsburgh, has returned from Europe. During his absence abroad Mr. Phipps visited Andrew Carnegie at Skibo Castle.

Sol. Haas, president of the Sloss-Sheffield Steel & Iron Company of Birmingham, Ala., has resigned. He will retire from the business on account of ill health.

E. E. Espenshade, general manager of the La Belle Iron Works, Steubenville, O., reports that work is progressing rapidly with the continuous universal plate mill now under construction.

Charles T. Henry, who has for a number of years been one of the most active representatives of the steam pump trade, has severed his connection with the International Steam Pump Company. He has opened offices at 120 Liberty street, where he is conducting a sales agency for several large well-known pump builders. Mr. Henry earned his reputation by the successful consummation of many of the largest steam pump transactions effected in recent years. He was connected with Henry R. Worthington.

Benjamin Hirsch of the firm of Aaron Hirsch & Sohn, the large metal merchants of Halberstadt, Germany, is visiting this country. He is making his headquarters at the New York office of the firm, 62 and 64 John street.



## QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING AUGUST 8, 1900.

Cap'l Issued.		Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
\$29,000,000	Am. Car & Foundry, Common...	1,300	-15½	.....	.....	-15½	.....	.....
29,000,000	Am. Car & Fy, Pref. (7½ Non-Cu.)	800	63 -63¾	.....	.....	-63	.....	.....
19,000,000	Am. Steel Hoop, Common.....	820	-18½	.....	19 -19¾	19 -20	.....	-19
14,000,000	Am. Steel Hoop, Pref. (7½ Cu.)...	300	.....	.....	67½-67¾	.....	.....	.....
50,000,000	Am. S. & W., Common.....	30,530	32¼-33¼	32¾-33	32¾-34¼	33¼-34¾	33¼-33½	33 -33¾
40,000,000	Am. S. & W., Pref. (7½ Cu.).....	1,775	73 -73¼	-78½	.....	-73½	73½-73½	.....
28,000,000	Am. Tin Plate, Common, N. Y....	1,390	22½-23	22¾-22¾	.....	.....	-23	22¾-23
18,325,000	Am. Tin Plate, Pref., N. Y. (7½ Cu.)	.....	.....	.....	.....	.....	.....	.....
7,500,000	Bethlehem Iron.....	26	.....	.....	-57	-57	.....	.....
15,000,000	Beth. Steel, Par \$50, \$1 paid in....	760	-14¾	-14¾	-14¾	-15	-15	.....
7,974,550	Cambria Iron, Phila*.....	78	.....	.....	-45	44¾-45	-44¾	.....
16,000,000	Cambria Steel**.....	3,306	.....	16 -16¼	16¾-16¾	16¾-16¾	16¾-16¾	-16½
11,000,000	Col. Fuel and Iron.....	3,740	32¾-32½	33 -33½	34 -34¾	35 -36½	35½-35½	35 -35¼
46,484,300	Federal Steel, Common.....	13,050	31¾-32½	32¼-32½	32½-34½	33 -34¼	32¾-33¾	32½-33¾
53,253,500	Federal Steel, Pref. (6½ Non-Cu.)	1,320	-65	.....	65½-66½	.....	65½-65¾	.....
32,000,000	National Steel, Common, N. Y....	1,170	.....	-24	.....	-25	24 -24½	.....
27,000,000	Nat'l Steel, Pref., N. Y. (7½ Cu.)	620	.....	.....	84½-84¾	.....	83½-84¼	-83½
40,000,000	National Stl. Tube, Common, N. Y.	14,289	.....	44½-44¾	45 -45½	46 -47	45½-46½	45½-46
40,000,000	National Stl. Tube, Pref., N. Y....	6,324	89¾-90	.....	89¾-90	89¾-90½	89¾-90	90 -90¼
5,000,000	Penna., Common, Phila.....	.....	.....	.....	.....	.....	.....	.....
1,500,000	Penna., Pref., Phila.....	30	.....	.....	.....	.....	-81	.....
12,500,000	Pressed Steel, Common.....	1,695	-39¾	39½-39¾	-39¾	40½-40¾	40¾-40¾	-40½
12,500,000	Pressed Steel, Pref. (7½ Non-Cu.)	1,470	-73	-73	-73	71½-71½	.....	.....
27,352,000	Republic Iron & Steel, Common...	3,070	9½- 9½	9½- 9¾	9½-10½	-10½	9 - 9½	- 9¼
20,852,000	Repub. Iron & Steel, Pref. (7½ Cu.)	1,549	50¼-50¾	.....	.....	-52	50¾-51½	50 -50¾
7,500,000	Sloss-Sheffield S. & I., Common...	.....	.....	.....	.....	.....	.....	.....
6,700,000	Sloss-Sheffield S. & I., Pref.....	100	.....	.....	.....	.....	.....	-65
20,000,000	Tennessee Coal and Iron.....	4,610	69½-69¾	69 -69½	69 -70¾	70 -71½	69½-70¼	69½-70½
1,500,000	Warwick Iron & Steel (par \$10)...	100	- 7½	.....	.....	.....	.....	.....

\* Par \$50. \*\* \$9 per share paid in. + 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. † Ex-dividend.

**Bonded indebtedness:** Am. S. & W., \$130,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$9,822,000 Illinois 5%, \$7,417,000 E. J. E. R. R. 5%, \$1,000,000 Johnson 6%, \$6,732,000 D. & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$2,561,000 6%; National Tube, none; Tennessee C. I. & R. Co., \$8,367,000 6%, \$1,114,000 7%, \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5%, Steelton, 1st, 1917, \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,351,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$880,000, Col. Coal & Iron Con. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock with accumulated dividends of \$640,000 to June 30, 1899.

## Iron and Industrial Stocks.

National Tube assumed the position of leader among the steel stocks the past week, owing to the very excellent showing made for the business of the company's fiscal year ended June 30. Strength was thus imparted to nearly the whole list, better prices ruling than a week since. Another stock recently developing strength has been Colorado Fuel, the company's earnings being reported to have about reached a point which will enable accrued dividends on the preferred to be paid off and thus leave the way open for the declaration of dividends on the common.

	Bid.	Asked.
American Bicycle Company, Common.....	6½	7½
American Bicycle Company, Preferred.....	31	33
American Bicycle Company, Bonds.....	79	81
E. W. Bliss, Common.....	.....	137½
E. W. Bliss, Preferred.....	125	.....
Cramp's Shipyard Stock.....	75	80
Diamond State Steel.....	3½	3¾
International Silver, Common.....	4	5
International Pump, Common.....	20	20½
International Pump, Preferred.....	66	67
Otis Elevator, Common.....	28	29
Otis Elevator, Preferred.....	86½	87½
Pratt & Whitney, Common.....	3½	5
Pratt & Whitney, Preferred.....	50	55
U. S. Projectile.....	95	100
Tidewater Steel.....	9	9½
U. S. Cast Iron Pipe Company, Common.....	3¾	4¾
U. S. Cast Iron Pipe Company, Preferred.....	29	32
H. R. Worthington, Preferred.....	.....	110
Empire Steel, Common.....	6	10
Empire Steel, Preferred.....	30	38

The H. C. Frick Coke Company of Pittsburgh have redeemed their remaining outstanding 6 per cent. gold bonds, payment having been made through the Union Trust Company of Pittsburgh.

The Shelby Steel Tube Company have declared a dividend of 1¼ per cent. on their preferred stock, payable August 15. Books close August 10 and reopen August 16.

The American Radiator Company have declared the regular quarterly dividend of 1¼ per cent. on their preferred stock, payable August 15. Books will be closed from August 9 to 16.

The Peck, Stow & Wilcox Company, Southington, Conn., have declared a quarterly dividend of 1¼ per cent.

The Consolidated Rubber Tire Company have declared a dividend of 1½ per cent., payable September 1. Books close August 20 and reopen September 4.

A dividend of 1½ per cent. on the common capital stock of the National Tube Company is payable on August 15 next.

The Alabama Consolidated Coal & Iron Company have declared a dividend of 1¼ per cent. on the preferred stock.

In the United States Circuit Court the Farmers' Loan and Trust Company of New York have filed a bill in equity against the American Wood Working Machine Company. The plaintiff company are the trustee of bonds to the amount of \$2,000,000 issued by the defend-

ant company, and the bonds are secured by a mortgage on the property of the defendant company. The bill alleges that the defendant company are insolvent, have defaulted in the payment of the interest on the bonds, and that receivers have been appointed for the company. It is alleged that there is certain property of the defendant company in the district, and the Court is asked to restrain the receivers from disposing of any property covered by the mortgage in question.

## The New Armored Cruisers.

The Secretary of the Navy issued on August 1 to shipbuilders a circular calling for bids for the construction of six armored cruisers, three authorized by the act of March 3, 1899, and three by the act of June 7, 1900. Those authorized by the first act are to be sheathed and coppered. Two classes of bids are called for in connection with these three vessels, one for sheathing and coppering and the other without it, the department reserving the right to adopt either form of construction.

The bids are to be opened December 7. The plans will be ready for distribution to the bidders November 8. No bids will be considered which propose to furnish vessels of less than 13,400 tons trial displacement for unsheathed vessels, and of less than 13,800 tons trial displacement for sheathed, or of less than 22 knots speed and a bunker capacity of 2000 tons.

The maximum time allowed for completion is 36 months for each vessel, with penalties of \$300 per day for each day in excess of that time for the first month and \$600 for each subsequent day. For deficiency of speed not below 20 knots the vessels will be accepted at a reduced compensation of \$50,000 for each quarter knot to 21½ knots, and \$100,000 per quarter knot down to 20 knots. The limit of cost of each of the three ships authorized by the act of 1899 is \$4,000,000, and of each of those authorized by this year's naval bill, \$4,250,000.

The attractions of the model town of Vandergrift, Pa., the home of the great Apollo Works of the American Sheet Steel Company, are tastefully set forth in a handsome book, entitled "Vandergrift: Its Homes and Industries," just issued by the Vandergrift Land & Improvement Company. The publication may be described as a real work of art, its printing, paper, illustrations, binding and general get up being alike of a high order, making it worthy of a place in any library. It is enriched with numerous half-tone engravings showing the mills, public buildings, churches and residences of Vandergrift, together with views of the beautiful hills among which the town nestles, and the picturesque Kiskiminetas River which flows past it. The growth of the town has been remarkable, and its development into its present high degree of prosperity and beauty reflects immense credit upon the energy and judgment of the men who conceived and carried out the plans.

## The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street,  
New York, August 8, 1900.

Conditions have not changed since last week, and, while in some quarters there is still a feeling of hesitancy, the tone of the market continues to strengthen. The market is slowly settling to the basis of the lower priced raw materials. In some instances this lower price level is not having a most harmonious effect, as certain manufacturers are still working with \$20 pig iron and have what now seems as a good deal of it still to come.

Builders of power generating apparatus are reaping a good business and they report entire satisfaction with the situation. Power transmission machinery is naturally favorably affected by this condition, as is also the structural steel trade.

Machine tool builders are still rather quiet, and no features of especial interest have presented themselves during the week under review.

There are a number of specifications under way for machinery for the Navy Department. The Bureau of Supplies and Accounts have just issued proposal blanks for several machines and tools to be installed at the yards at Boston, Mass. The bids will be opened at noon August 14. On the same date bids will be opened for machine tools for the New York Navy Yard and for the shop at Annapolis. The tools to be installed at Boston include one key seating machine, one gear planing machine for shaping spur gears, one horizontal boring, drilling and milling machine with motor, one vertical eight-spindle multiple drill press, one 60-inch boring and turning mill, one 18-inch slotting machine, one 2-inch automatic bolt cutter, one 12-inch swing engine lathe, one No. 3 centering machine, one 15-inch shaping machine, one universal tool and cutter grinder, two 28-inch vertical drills, one arbor press, three universal radial drills to drill to center of 11 feet, one dovetailing machine, one combined jointing, edging and timber ripping saw, one triple-drum sander, a quantity of structural shapes, one locomotive crane, standard gauge, the hoisting capacity to be at least 10 tons at 16 feet radius and 5½ tons at 25 feet.

It is reported that the Missouri, Kansas & Texas Railroad will build a new system of shops at Parsons, Kan. Parties here who are working on the job state that a new car shop will be built which will be 48 x 132 feet. The work will also include a blacksmith shop, 150 x 70 feet; a tank and wheel shop, 125 x 60 feet, and a boiler shop, which will be 150 x 80 feet.

A large addition is being built to the works of the Wyoming Shovel Works, at Wyoming, Pa. Machinery for the equipment of the extension is now being purchased. A contract was given to Woolston & Brew of 141 Broadway for a 300 horse-power Brown engine. The Dodge Mfg. Company of 43 Dey street and Mishawaka, Ind., received the order for the power transmission machinery. This work includes a main jack shaft and three Dodge continuous systems of rope drives, one being a 300 horse-power drive from engine to jack shaft.

The Dodge Mfg. Company have just closed a contract with the Lestershire Mfg. Company of Lestershire, N. Y., for an elaborate system of Dodge continuous rope drives, to be installed in an addition which the company are building to their plant. The concern manufacture shoes. Their entire plant is now equipped with Dodge rope drives.

A new plant is now in course of construction at Aldine, N. J., for the Jackson Architectural Iron Works of 315 East Twenty-eighth street, New York. This company have occupied their present plant for many years, and much of its equipment is slightly antiquated. It is said that almost an entire new equipment will be purchased for the new plant, and that only the most recently acquired modern machines are to be taken to Aldine. This plan will necessitate the purchase of much new machinery.

A prominent local engineer has just completed plans and specifications for a 100-ton copper concentrator and plant, which is to be built at Dorchester, New Brunswick, by the Intercolonial Copper Company. The offices of the latter concern are at Providence, R. I. He has also prepared plans and specifications for a 100-stamp mill, together with power plant, electric transmission drills and pumping machinery for the Old Reliable Gold Mining Company, who will build a new plant at Golden, Mexico. The offices of the Company are at Boston, Mass. Both of these companies are now in the market for the necessary equipment.

George A. Barden, Eastern representative of the Standard Pneumatic Tool Company, whose offices are at 141 Broadway, is experiencing a good demand for pneumatic tools of all kinds. He has just booked a large order for the complete equipment of the new plant of the Havana Dry Dock Company of Havana, Cuba. This company are controlled by Kiojewski & Pesant of 32 Broadway. A large order has just been received

by the Standard Company from the Navy Department for tools to be added to the equipment at the New York Navy Yard. The company now have about 70 tools in operation in this yard. E. N. Hurley, president of the company, is now abroad, arranging for the building of shops in Europe. The European demand has been so great that it has been found expedient to manufacture the tools in Europe. Machinery and equipment for the new shops will soon be purchased.

It is reported that Lord & Burnham of Irvington, N. Y., are purchasing machine tools quite liberally. They are filling up their plant, and it is hinted that operations are under way for an extension of their works. The company are builders of large horticultural buildings and their equipments.

The International Steam Pump Company just placed an order with the Buffalo Forge Company of 39 Cortlandt street for a number of high speed engines.

Charles A. Schieren & Co. report a heavy demand from Mexico for leather belting. They have just received an order from the Compania Metalurgica Mexicana for 122 feet of 22-inch three-ply belting, which is to be used at the company's Mexican turning plant. They have booked an order for 1200 feet of various sizes of belting for the equipment of a sugar plant at Santa Domingo. From Saltillo, Mexico, they have just booked an order for 1800 feet of leather link belting. This style of belting is extremely popular in the interior of Mexico for several reasons. In mining regions it is liked because there is no cement in its composition, and therefore absolutely water proof. Another reason for its popularity is that it can be shortened and lengthened by any of the workmen, not requiring a skilled mechanic for the purpose. One great advantage in its behalf, however, is the fact that it can be transported in sections. Where the belting is used in the interior it is necessary to transport it by mule back. The belting is ordered shipped in sections weighing about 200 pounds each, and when it arrives at its destination it can easily be fastened together in the required lengths. An instance of this kind has recently come to light. The Schieren Company received an order for a large quantity of heavy belting, the greater portion of it being 30 inches wide and 1 inch thick. The material was for the Batopilas Mining Company of Batopilas, Mexico, which is about two weeks, mule time, from Chihuahua, the nearest railroad station. The belting was shipped in 19 sections of 200 pounds each, and consequently it was a comparatively easy matter for shipment into the interior. During the month of July Charles A. Schieren & Co. have shipped more goods to Mexico than to any other foreign country.

Johnson & Johnson, manufacturing chemists of New Brunswick, N. J., have just placed orders for a 500 horse-power addition to their power plant. They have purchased Babcock & Wilcox boilers. They have also purchased a system of fuel economizers from the Fuel Economizer Company of 74 Cortlandt street and Matteawan, N. Y.

Contracts are being given out by Westinghouse, Church, Kerr & Co. for a large power plant which is to be added to the brass mills of the Scoville Mfg. Company of Waterbury, Conn. Hugh L. Thompson of Waterbury is the designer of the new plant. The plant will be equipped with induced draft apparatus and economizers.

An order has been received at the New York office of the Webster Mfg. Company for the entire equipment of an 800,000 bushel grain elevator. The elevator will be built at Staten Island, N. Y., by the American Linseed Company. The work is valued at \$300,000. It includes power transmitting machinery, elevating and conveying machinery, &c. It will be operated by electricity throughout. The entire plant will be of steel and as pear fireproof as it can be made.

The New York & Staten Island Electric Company of Livingston, S. I., have just ordered the bulk of the material required in the building of a new power station. They have purchased the equipment which the North River Heat, Light & Power Company purchased some time ago, but which has never been delivered. The apparatus aggregates about 3000 horse-power. The North River Heat, Light & Power Company have recently been absorbed by the United Gas & Improvement Company of Philadelphia. The E. P. Allis Company received the order for the heavy engines. Westinghouse received the order for the generator. It is said that Cahall boilers will be installed. McClave, Hamilton & Rimmer of 85 Liberty street received the two compound engines and exciter dynamos. It will be recalled that when the North River Company, of which A. K. Bonta was president, was absorbed by the United Gas & Improvement Company all work on the new Hoboken plant was stopped. McClave, Hamilton & Rimmer received an order for two 300 horse-power engines, direct connected to 200 kw. generators, to be installed in the new power plant of Bloomingdale Brothers' New York department store.



## The Chicago and Northwest Machinery Market

Office of *The Iron Age*, 1905 Fisher Building, (Chicago, August 4, 1900.)

The reports received from machinery manufacturers and dealers relative to the course of business during the month of July indicate a much better condition of business than it had been supposed would be found to exist. Almost without exception, the manufacturers and dealers who have been interviewed speak of a fair volume of business and talk encouragingly of future prospects. It is particularly satisfactory to note that inquiries for export are keeping up as well as sales to the domestic trade. In very few cases are any discouraging reports received. A special feature is the increase latterly observed in inquiries for fall delivery, which would indicate that as the season advances a larger volume of business is to be expected.

The Dodge Mfg. Company, Mishawaka, Ind., say there seemed to be about the same average of inquiry and orders running through the month of July as in May and June, and they have noted no material slackening up in their business. They have received orders for three large cotton mill outfits during the past two weeks, and also some machinery for Portland cement plants. Their New England business is fully up to the standard of any previous period.

Chas. H. Besly & Co., Chicago, Ill., state their general business is still very good. They are receiving many orders for Helmet oil and are making shipments to Colorado, Dakota, Montana, California and other western points. They have just received orders for two complete shop equipments to go to India, including lathes, chucks, drills, screw plates, Gardner die stocks, Helmet oil, &c. They are receiving many orders for their Gardner grinders and have recently made shipments to Ohio, Pennsylvania, New Jersey and New York. Aside from the orders they are receiving for their own specialties they note a good demand for general machinists' supplies. Their stock being so varied, and each department being so complete, they are enabled to make prompt shipments of any of the material shown in their catalogue, copy of which is sent free to any address upon application.

The Hoefler Mfg. Company, Freeport, Ill., say that their business is constantly keeping up, and they have thus far been unable to catch up with their orders. While there is a slight decrease in the orders for drill presses, yet the increase in demand for their furniture spring machinery and hack saws has materially increased both in this and foreign countries. The future prospects are good.

The Adams Company, Dubuque, Iowa, say that on account of the decline in raw material most people are putting off ordering as long as possible, which makes most plants very much in need of orders. The demand for their milling machine is steadily growing, and they are about two months behind their orders. The molding machine business has only been fair the past two months. A number of orders for exporting have been received, which trade is growing with them. Notwithstanding the unfavorable present conditions, they expect a very satisfactory business the balance of this year.

The Novelty Iron Works, Dubuque, Iowa, say that there was a decided lull in business throughout the month of June and the early part of July, and they had reason to believe that there would be no improvement until September, but have been agreeably surprised to note a material change for the better within the last ten days, and the outlook seems to indicate an early revival of trade. They have made no changes in prices, having anticipated a decline months ago, and while their profits were adversely affected during the late period of advancing prices, they now have the satisfaction of securing orders at the established price with the declining market in their favor. Collections are unusually good, and as prices seem to have settled down to a steady basis, they think trade will gradually improve from this time until after election. The company have lately completed a line of patterns for a small sized power hammer to be used for riveting in the manufacture of shovels, &c., and are also bringing out a machine for stripping the insulation from heavy copper wire used in electric lighting.

The M. C. Bullock Mfg. Company, Chicago, have found the month of July quite satisfactory. While there has been some decline in the number of inquiries, it is chiefly in that class from which no business is to be expected, and the number of promising inquiries has considerably increased. In addition to the actual orders recently secured they have out a greater number of propositions likely to be accepted than they have had for some time. Their export business is particularly gratifying. They have received an order from the Government of Chili for a 2500-foot drill and outfit, and one

from the Government of Nova Scotia for an 800-foot equipment. They have also orders from Spain and Mexico and have sold quite a number of diamond drills to the Western States. They have just shipped a six-drill plant to the Sea of Azoff and two carloads of machinery for Australian parties, and are building a Williams high speed central valve engine for St. Petersburg. They have also received orders for another 10-foot fan to go to West Virginia and a hoist for Northern Michigan.

The Nordberg Mfg. Company, Milwaukee, Wis., say that inquiries are keeping up reasonably well and a great deal of work is being placed, though some parties are insisting upon modified figures. Of course, in view of the general fall in prices on iron and steel products, it is possible to shade figures below the highest rates demanded last winter, and it is their experience that such shading is very general. They booked during July no notable contracts, but got some desirable standard work and have on hand orders that will keep them running night and day for a number of months to come. Because of the increased movement in all lines, due to the general modification of prices, they look to a rather active business in their line for the balance of the year.

Wickes Brothers, Saginaw, Mich., report business in their line for the month of July considerably better than in the month of June. They have had more inquiries and have taken quite an amount more of actual orders. They believe business is shaping itself to return to its old time vigor some time in the early fall. They report an order for the Dells Paper Company, Eau Claire, Wis., for 600 horse-power of their vertical water tube boilers and 700 horse-power Corliss engine, heater, &c.; from the Barney & Smith Car Company, Dayton, Ohio, 1500 horse-power of their new vertical water tube boilers; second order from E. C. Warner, Minneapolis, for a 200 horse-power boiler, and from the Baltimore & Ohio Railroad Company, for their new grain elevator at Chicago, 100 horse-power of vertical water tube boilers.

The Union Steam Pump Company, Battle Creek, Mich., report the month of July as having been better than they had expected. Business appears to keep up, although not so brisk as during the earlier months of the year. Notwithstanding their condition, there appears to be every indication that prices of crude material will continue to be high, and this of necessity places the goods at higher prices than heretofore. Iron and copper must approximately lower prices, or the country is sure of disappointment not far in the future.

The H. W. Caldwell & Son Company, Chicago, say their shops are quite busy at present, although this is probably due to the peculiar character of their trade, which during the summer consists largely of supplying cotton seed oil mills and other Southern industries with their machinery. They are inclined to believe that trade will generally be good during the coming fall and see no reason for expecting a slump in the manufacturing line.

Manning, Maxwell & Moore, Chicago, say that trade has dropped off both in the city and country, as it always does in July. There are quite a large number of orders from the different railroads and from some of the harvesting machine companies who are installing new machinery that should have been placed a month ago, but are pigeon holed for various reasons, the main one being probably the expectation of a considerable drop in the price of machine tools. There is, however, a very hopeful feeling, every one predicting a good trade after the holiday months, providing there is no undue political excitement to interfere with it.

Perry Ransom, Oshkosh, Wis., states that he has found the month of July rather quiet, but on the whole thinks it a little better than the month of June. He has several inquiries on hand, some of which he considers must turn to orders. Take it all around, business is a little better than looked for this summer. There has been an unusual call for grinding machinery, electrically driven. So far he has not brought out any machines of this description, as he hardly thinks they have come to stay.

The Edward P. Allis Company, Milwaukee, Wis., say that they have no especially notable sales to report the present month. They have a number of important negotiations verbally closed, but these matters are as yet not ready for publication. It is their experience that there is less general inquiry, but a very large number of orders of importance are still in the market.

The Gardner Governor Company, Quincy, Ill., say that July has been a very satisfactory month for them. They anticipated a falling off in business, but it has not come, and while they do not wish to create the impression that shops are crowded with work, nevertheless business appears in a healthy state and they have no reason to complain whatever. They have anticipated and still feel that it will come soon, but conditions have been so opposite to what they expected that they would not care to venture a prediction.

The S. Freeman & Sons Mfg. Company, Racine, Wis.,

say their sales for the month of July have been as good, if not better, than they were for the same month last year. They anticipate that trade will for some time at least be equal to, if not better, than any similar period they have experienced since they have been in business. They expect to put in a 250 horse-power Corliss engine and make other needed improvements this fall.

The Whiting Foundry Equipment Company, Harvey, Ill., report that the volume of business received for the last few weeks has been light. Their courage and hopes, however, have been maintained by many inquiries coming in for goods in their line. Many projects have been abandoned recently and others have been postponed into the future.

The American Steam Pump Company, Battle Creek, Mich., have found the demand for their output during the month of July about the same as during previous months of the present year. They do not see any indication of a falling off in business; in fact, both the home and foreign demand seems to be gradually increasing. They are at present about three months behind in orders.

The Fred. W. Wolf Company, Chicago, say the ice machine business for the past month has been rather quiet. However, in the course of a month or six weeks, they expect quite a revival.

The Fox Machine Company, Grand Rapids, Mich., say they have seen very little change in business during this month. If anything, it is more quiet than they had anticipated. They do not look for any large increase in business until after the November election.

The Stover Mfg. Company, Freeport, Ill., say that their trade on machinery for this month is keeping up in the same ratio as the past month, and they will realize fully as large a business as in the previous month.

The Marshall & Huschart Machinery Company, Chicago, find a good demand for machinery, and the present month is one of the best summer months in their experience. They think the future very promising. This company have recently been appointed agents for Colburn key seaters and Baker heavy drills.

The American Well Works, Aurora, Ill., find business exceedingly good, and more is offered than they can take care of. There is a little falling off in number of inquiries, but business is all right.

The Maywood Foundry & Machine Company, Chicago, Ill., say that their Mr. Highland has just returned from Pittsburgh and vicinity and brings with him a very handsome line of orders for their molding machines and pneumatic sand rammers. They have experienced very little slackness in their business and, in fact, are receiving orders for their products about as rapidly as they can comfortably turn them out. They have experienced no material reduction in their foreign trade, which holds up admirably in view of reports from some sources that there has been some decline in this trade.

The Otto Gas Engine Works, Chicago, say that since July 1 they have had a larger percentage of inquiries for railroad business than for any time this year. Orders have not started freely yet, but indications are that there will be considerable work done in spite of the approaching campaign.

The Chicago House Wrecking Company, Chicago, say that marked increase in activity and free buying are the features of the machinery business for the month of July, as they have experienced it. They have been flooded with a world of inquiries for large sized engines and boilers and have made sales of over 15 high speed engines, ranging in size from 12 x 20 inches to 26 x 48 inches. They express unbounded faith in this fall's business, basing their faith on the large number of inquiries they are receiving.

Pawling & Harnischfeger, Milwaukee, Wis., advise us that trade continues to be satisfactory, the volume of both inquiries and orders holding well up with the average of previous months. They have no reason to look for a decline in the amount of future business. They have booked no orders of special interest, with the possible exception of a double extension four-motor electric traveling crane for the New York Shipbuilding Company. They have also received electric crane orders from Goulds Mfg. Company, Seneca Falls, N. Y.; Lukens Iron & Steel Company, Coatesville, Pa.; Reading Coal & Iron Company; A. L. Themes Works, Werkstad, Christiania, Norway; American Tin Plate Company; S. Morgan Smith Company, York, Pa.; Hackensack Water Company, and the Beaver Dam Malleable Iron Company, with the usual complement of hand cranes, hoists, trolleys, &c.

The Chicago Pneumatic Tool Company report a gratifying increase in their sales for the month just closed over the corresponding month of last year, this being a repetition of their history from year to year since the organization of the company. The chief difficulty has been, and still continues to be, that of filling orders promptly. To correct this the company have in course of construction at Detroit a very large and extensive plant for the production of their tools, which it is hoped

to have in operation during September. The recent opening of the Olney plant of this company it was thought at the time would relieve the pressure somewhat, but the increase in business seems to outstrip the enlargement contemplated at that time; but for the purpose of catching up with the orders now in hand, so as to cause as little delay as possible in filling orders during the removal of the plant at St. Louis to Detroit, the factories are working night and day, with a larger corps of employees than ever before. Among the notable orders received during the month, after severe competitive tests, were the following: The entire order of the General Electric Company, Schenectady, N. Y.; the entire order for the equipment of the addition to Cramps' Shipyards, at Philadelphia; the entire requisition of the Philadelphia & Reading Railway; the order of the Maryland Steel Company, at Sparrow's Point, and the entire order of Riter & Conley Company, Pittsburgh, Pa., besides large and increasing orders from foreign countries have been received. During the month the Richmond Locomotive Works adopted the Boyer drill as standard, placing an order for 34 No. 3 drills, in addition to the large number already in use by that company.

### Bids for Machine Tools for the Navy.

WASHINGTON, D. C., August 7, 1900.—The Navy Department to-day opened bids for machine tools, &c., for the Mare Island and Norfolk navy yards. The bidders and their proposals were as follows:

#### Mare Island.

Bidder 1, U. Baird Machinery Company; 2, Geo. H. Tay; 3, Henshaw, Bulkeley & Co.; 4, Parke-Lacey Company; 5, Tatum & Bowen; 6, Alonzo A. Watkins; 7, I. S. Van Winkle & Co.; 8, Dunham, Carrigan & Hayden Company; 9, Merchant & Co.; 10, L. Lebenbaum; 11, J. B. Kendall; 12, Geo. W. Gibbs Company; 13, Drew Machinery Agency.

Class 1. One 15-inch by 6-foot universal monitor lathe.—Bidder 1, \$700; 3, \$714; 4, \$771; 13, \$705.

Class 2. One 24-inch swing pattern makers' lathe.—Bidder 1, \$190; 3, A \$140, B \$150; 4, \$189; 5, \$115; 13, \$298.

Class 3. One fret scroll saw.—Bidder 1, \$166; 3, \$95; 4, \$124.25; 5, \$115.70; 13, \$108.

Class 4. One endless bed surface planer.—Bidder 1, \$850; 3, \$675; 4, \$522.40; 5, \$649.

Class 5. 600 sheets steel.—Bidder 2, \$576.20; 6, \$526.30; 7, \$579.81; 8, \$569.90; 11, \$597.70.

Class 6. 900 sheets steel.—Bidder 2, \$2700.61; 6, \$4710.85; 7, \$4413.73; 8, \$4933.18; 9, \$4769.11; 11, \$4757.56; 12, \$4664.13.

Class 7. 20 copper glue pots.—Bidder 2, \$83.40; 10, \$92.90.

Class 8. 1350 sheets galvanized iron.—Bidder 2, \$1433.19; 6, \$2414.31; 7, \$2188.90; 8, \$2523.17; 9, \$2465.88; 11, \$2454.65; 12, \$2442.13.

#### Norfolk.

Bidder 1, Manning, Maxwell & Moore; 2, N. J. Clark Company; 3, New Jersey Foundry & Machinery Company; 4, Ward & Huntington; 5, Smith & Courtney; 6, Manhattan Supply Company; 7, F. H. Lovell & Co.; 8, Mayer & Co.; 9, Geo. L. Neville; 10, William Sellers & Co.; 11, Prentiss Tool & Supply Company; 12, Edwd. J. Ettinger; 13, Pawling & Harnischfeger; 14, Morgan Engineering Company; 15, Francis Harrell; 16, Gould & Eberhardt; 17, Niles Tool Works Company; 18, Porter Company; 19, George Place; 20, Burnett Company; 21, White Hardware Company; 22, U. Baird Machinery Company; 23, B. R. Browning; 24, Drew Machinery Agency.

Class 1. Lot lantern fixtures.—Bidder 7, \$420; 9, \$210; 18, \$426; 20, \$411.24.

Class 2. One electric overhead traveling crane.—Bidder 1, A \$5735, B \$5324; 3, \$5777; 10, \$7000; 11, \$5115; 12, \$6575; 13, \$6250; 14, \$4790; 17, \$6570; 23, \$5250.

Class 3. One universal monitor lathe.—Bidder 19, \$833; 22, \$656; 24, A \$652, B \$616.

Class 4. One 43-inch upright drill press.—Bidder 1, \$1650; 5, \$1759; 16, \$1690; 22, \$1480.

Class 5. Lot bronze butt hinges.—Bidder 2, \$1777.63; 4, \$1446.50; 6, \$1897.70; 8, \$1926; 9, \$1923.75; 15, \$1735.50; 21, \$2376.

W. L. C.

**Information Wanted.**—Who manufactures shears and machinery for cutting leather belting?

The Pere Marquette Railroad has contracted with the American Shipbuilding Company, at Cleveland, for a new car ferry similar to the recently completed Pere Marquette, but 40 feet longer and capable of carrying 12 more cars and possessed of far greater power and speed. The boat will have accommodations for 150 passengers in addition. It will cost \$400,000 and will run between Ludington and Manitowoc.



# HARDWARE.

## Condition of Trade.

WHILE no retrograde movement is seen in the moderate demand for goods which has recently characterized the market, it must be admitted that but little improvement is found in general conditions. Orders continue to be for small lots, entailing considerable labor in proportion to the quantity of goods shipped to individual customers, but in the aggregate the volume of business is fairly satisfactory for the season. Stocks are being sorted up for present requirements in a conservative manner. The wholesale trade, however, are looking forward to a fair business in the fall and consider the prospect encouraging for the remainder of the year. The opinion is freely expressed that should the unsettled condition of the Iron market take a change for the better, an increased demand in all lines would result. Meanwhile extreme caution prevails and stocks are being kept as light as possible while price readjustments are in progress.

### Chicago.

(By Telegraph.)

Traveling salesmen give encouraging views of the commercial possibilities throughout the West. About 40 salesmen of one local jobber were called in last week for conference, and it is said that without exception they reported a most satisfactory feeling in their respective territory, comprising States from Indiana to Nebraska, inclusive, but not extending up into the Dakotas. The crop prospects are pronounced by the traveling salesmen most flattering, with an abundance of purchasing power and a general feeling of cheerfulness among the farmers. The state of the Hardware trade bears out these reports. A good seasonable demand is reported. Fall trade has not yet set in, as it has in previous years at about this time, for the distinguishing trait of the average merchant is to wait until goods are needed and then order them. That this policy does not tell heavily against the volume of business is the surprising feature. One seller reports present trade running quite largely to Sheets, both Galvanized and Black, the trade being notable for the great number of orders, but all for small lots. Heavy Hardware continues active in all departments.

### St. Louis.

There is no noticeable change from conditions prevailing last week. However, one of the careful observers in the jobbing trade who has just returned from the usual vacation states that the absence has enabled him to see an agreeable improvement in the nature of sales. Merchants are not buying lavishly, it is true; but there is perhaps less hesitation to buy for immediate needs and a trifle over for stock. It is a fact that the commencement of the week brought in quite a handsome batch of orders well distributed among the local jobbers. Interest centers on the crops now in sight. In Tennessee and Kentucky corn is said to be doing well, tobacco is in good form, and an average crop of wheat will possibly bring more in value than did last year's yield. Reports from travelers continue favorable as to the territories they cover. There is room for improvement in Stamped and Pieced Tinware, but it is said that late business has contributed to an increase in sales. Some cutting in Galvanized and Black Sheets on the part of jobbers is spoken of. There is some movement in Sheets and also Corrugated Iron. The St. Louis trade in Builders' Hardware and Mechanics' Tools is not comparing favorably

with previous years. Various causes, not necessary to dwell on here, have brought about the limited building operations; interest in this case centers in the effect, as will be seen by the figures below, which we have compiled from the monthly records of the St. Louis Building Commissioner. For the seven months ending July 31 the number of permits and the estimated value of new buildings and improvements they authorized during 1898, 1899 and 1900 were respectively 1584, \$4,917,847; 1378, \$4,794,861; 1335, \$3,110,683. Jobbers in Heavy Hardware report an improvement in demand. Stocks of Iron and Steel in jobbers' hands are becoming broken, and as but few mills are running, difficulty is had in meeting buyers' requirements.

## Notes on Prices.

**Wire Nails.**—Conditions remain unchanged in the Wire Nail market so far as the size of orders is concerned. Large buyers still purchase in small lots, and are likely to continue this policy until there is more of an equality in the price of the raw material and the finished product. Prices are firm without change, as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**New York.**—The policy of confining orders to small quantities is still pursued by buyers. The amount of business thus transacted amounts to fair proportions for the season. Quotations are as follows:

To retailers, carloads on dock.....	\$2.48
Small lots from store.....	\$2.55 to \$2.60

**Chicago, by Telegraph.**—There is steady growth in the current Wire Nail trade. July closed well, August opened better. Both from mill and store reports indicate a marked improvement in demand, and the present volume seems to be suggestive of old time trade, though it is all in dribblets. Prices remain at \$2.43 for carloads and \$2.50 for small lots from store.

**St. Louis.**—No change in demand for Wire Nails is noted. No speculative inclination is shown. Trade are buying as stock is needed. The carload price to retailers is \$2.45, base; in less than carloads, \$2.55, base.

**Pittsburgh.**—There is nothing of interest to report in Wire Nail market. Buying continues to be confined to small lots, which keeps the aggregate volume of tonnage very light. Some of the trade continue to anticipate lower prices. We quote Wire Nails as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off in 10 days

To jobbers in carload lots.....	\$2.20
To jobbers in less than carload lots.....	2.25
To retailers in carload lots.....	2.30
To retailers in less than carload lots.....	2.40

**Cut Nails.**—Unchanged conditions prevail in the Cut Nail market, and orders for small lots are the rule rather than the exception. Some irregularity in prices is reported. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days:

Carload lots.....	\$1.95
To jobbers in less than carload lots.....	2.00
To retailers in less than carload lots.....	2.10

**New York.**—The local demand for Cut Nails continues moderate in volume. Orders are for small lots, but frequent. Quotations are as follows:

To jobbers in carload lots on dock.....	\$2.13
To jobbers in less than carload lots on dock.....	2.18
To retailers in less than carload lots on dock.....	2.31
Small lots from store.....	\$2.25 to 2.30

*Chicago, by Telegraph.*—Prices for Cut Nails are said to be holding fairly well this week, with demand of an ordinary character. Buying is in small lots, and quotation for store is \$2.25.

*St. Louis.*—The trade say the price of Cut Nails is so nearly that of Wire Nails that no buying of moment is being done; \$2.30, base, remains the price of stock.

*Pittsburgh.*—There is some unevenness in prices of Cut Nails, in spite of the fact that the manufacturers reaffirmed present quotations recently. The volume of trade in Cut Nails is light, buyers placing orders only for small lots, evidently anticipating that prices may be lower. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off in 10 days:

Carload lots.....\$1.95  
To jobbers in less than carload lots..... 2.00  
To retailers in less than carload lots..... 2.10

As noted, there is some unevenness in above prices.

**Barb Wire.**—The distribution of Barb Wire is limited, as it has been during the greater part of the season. The outlook for fall business in this line is considered quite satisfactory. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....\$2.50  
To jobbers in carload lots, Galvanized..... 2.80  
To jobbers in less than carload lots, Painted..... 2.55  
To jobbers in less than carload lots, Galvanized.... 2.85  
To retailers in carload lots, Painted..... 2.60  
To retailers in carload lots, Galvanized..... 2.90  
To retailers in less than carload lots, Painted..... 2.70  
To retailers in less than carload lots, Galvanized... 3.00

Ellwood and Baker Wire is 5 cents and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

*Chicago, by Telegraph.*—A leading jobber a few days ago asked the foreman in his warehouse for heavy goods what product was moving best, and received the reply, Barb Wire. The apparent explanation is that the buying, not done last spring, is now in progress. Farmers have reaped, and the fences need looking after. From 1 to 5 tons is a good average size of these orders, but they are numerous. Prices continue without change. Quotations for small lots, Chicago delivery, are \$2.40 for Plain Annealed, \$2.75 for Painted Barb and \$3.10 for Galvanized Barb Wire.

*St. Louis.*—Not much in action and price unchanged for Barb Wire. Price in carload lots to retailers for Painted is \$2.75; less than carloads, \$2.85, 30 cents advance is asked for Galvanized.

*Pittsburgh.*—Present volume of business in Barb Wire is extremely light, but is expected to improve when fall trade opens up. We quote: Galvanized Barb Wire, \$2.80, in carload lots to jobbers, and Painted at \$2.50. Terms, 60 days net, with 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

**Plain Wire.**—No especially new features mark the condition of the Plain Wire market. Demand is fair, but for small lots. Quotations continue as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	
	Plain.	Galv.
To jobbers in carload lots.....	\$2.15	\$2.55
To jobbers in less than carload lots.....	2.20	2.60
To retailers in carload lots.....	2.25	2.65
To retailers in less than carload lots.....	2.35	2.75

The above prices are for the base numbers, 6 to 9. The other numbers of Plain Wire and Galvanized Wire take the advances indicated in the following table:

**Plain Fence Wire Advances (Catch Weights).**

Nos.	Base	Galvanized.
6 to 9.....	\$0.05 advance over base.....	\$0.40 extra.
10.....	.10 " " " " " " " " " " " "	.40 "
11.....	.15 " " " " " " " " " " " "	.40 "
12 and 12½.....	.25 " " " " " " " " " " " "	.46 "
13.....	.35 " " " " " " " " " " " "	.40 "
14.....	.45 " " " " " " " " " " " "	.75 "
15.....	.55 " " " " " " " " " " " "	.75 "
16.....	.70 " " " " " " " " " " " "	1.00 "
17.....	.85 " " " " " " " " " " " "	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

*Pittsburgh.*—The general conditions of the Plain Wire market are unchanged. Demand is for small lots. We quote:

	Plain.
To jobbers in carload lots.....	\$2.15
To jobbers in less than carload lots.....	2.20
To retailers in carload lots.....	2.25
To retailers in less than carload lots.....	2.35

Galvanized Wire up to No. 14 is 40 cents advance on Plain, Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. discount allowed for cash if paid in 10 days from date of invoice.

**Glass.**—The wage question for the coming fire remains unsettled between the flatteners and the American Window Glass Company, but it is understood that the latter are preparing to start their factories on September 1. Jobbers report trade quiet because of the high prices in building materials. Quotations are as follows:

**Carloads from Factory.**

Single strength:  
First bracket.....85 and 10 %  
Second and third brackets.....85 and 15 %  
All above.....90 and 5 %

Double strength:  
First five brackets.....89 %  
60-inch bracket.....90 %  
70 and 100 inch brackets, inclusive..90 and 10 and 5 %  
All above.....90 and 20 %

**Eastern Jobbers, Less than Carload Lots.**

Single strength:  
First bracket.....80 and 10 and 5 %  
Second and third brackets.....85 %  
All above.....85 and 20 %

Double strength:  
First bracket.....85 %  
Second, third, fourth, fifth and sixth.....85 and 10 %  
All above.....85 and 20 %

**Western Jobbers, Less than Carload Lots.**

Single strength:  
First bracket.....80 and 20 %  
Second and third brackets.....85 %  
All above.....85 and 20 %

Double strength:  
First five brackets.....85 and 10 %  
Sixth bracket.....85 and 20 %  
All above.....85 and 25 %

Ten per cent. extra for single strength, A. A.

Freight equalized with nearest jobbing center.

It is reported that notwithstanding the change in price from 85 and 5 per cent. discount to 85 and 10 on the first five brackets of double strength glass, by Western Jobbers on July 26, cutting of price continues.

**Paints and Colors.**—**Leads.**—No advance has been made in the price of White Lead in Oil as a result of the increase last week of ¼ cent in the value of Pig Lead. It is possible that further advances would cause manufacturers of Lead products to advance their prices. Quotations are as follows: In lots of 500 pounds and over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

**Oils.**—**Linseed Oil.**—The only purchasers of Linseed Oil are those who are in actual need for immediate requirements. Stocks are generally considered low, but even these conditions result in but a moderate demand. It is reported that crushers are unwilling to take orders for future delivery, as they desire to discourage this method of purchasing. What their future course in this matter will be remains to be seen. Flax Seed continues to decline in price as the new crop comes in, and is quoted at about \$1.36 per bushel for spot, with lower prices for August, September and October delivery. Prices for prompt delivery of City Raw Oil remain 67 cents per gallon in lots of five barrels or more and 68 cents in lots of less than five barrels. State and West-



ern brands are quoted 2 cents per gallon less. The usual 2 cents per gallon extra is charged for Boiled Oil.

**Spirits Turpentine.**—Since the first of the month prices of Turpentine at this point have fallen off and are now as follows: Southern, 43 cents per gallon; machine made barrels, 43½. Demand is limited to small lots, as consumers and other large buyers do not consider present values attractive.

## Better Laws for Business Men and What is Being Done to Secure Them.

[A paper read at the recent meeting of the Michigan Hardware Association, at Detroit, by E. Marks, vice-president of the Mercantile Association of Michigan, and vice-president of the Detroit Retail Grocers' Protective Association.]

**OUT OF DATE LAWS.**—We have to-day many laws on our statute books which were enacted years ago when our State was new and unsettled, and they were framed to cover conditions existing at that time. Some of these laws appear to have been enacted with but one effect in view, that being to induce people to settle in this State. When once here, they were given privileges and liberties which I believe could not be secured in any other country in the world. I refer now to the exemption laws of this State, which I believe are responsible for some of the worst of the commercial ills with which the merchants have to grapple. Some of these laws may be changed by legislative enactment, and others only by a constitutional amendment, which is a very difficult problem. It is not my intention to take up these laws in detail, as nearly all merchants are well acquainted with the provisions of these exemption laws, and I think you will agree with me that all are entirely in favor of the debtor and offer a premium on dishonesty. The most important of these exemptions is the wage exemption law, which robs the honest debtor of his credit and affords no protection whatever to the creditor, but provides the means for a horde of deadbeats and dishonest rascals to live at the expense of the honest debtor and creditor.

The time is at hand when the State of Michigan should withdraw some of these extremely liberal inducements to the undesirable classes from anywhere and everywhere to prey upon the thrift and industry of our honest citizens. It is not my intention to discuss the class of laws desired in this paper to any extent, but I will try to point to the way to secure much needed legislation and to show what is being done in that direction.

**ORGANIZATION NECESSARY.**—I believe there have been attempts made at every session of the Legislature for the past 16 or 18 years to secure some amendments to the exemption laws. A movement would be started first in one section of the State and then in another, backed up by a handful of men who had an honest desire to secure the passage of such amendments. Time and money would be expended at every attempt, but always ended in failure up to the session of 1899. We might ask why previous attempts were not attended with success? The answer is: Lack of organization. Only a few people realize the magnitude of such an undertaking and the force that is required to secure the passage of such legislation, and unless you have such organization that you have the co-operation of merchants covering every section of the State, there can be no hope of success. These men who constitute the State Legislature are advised and handled by their constituents. They hold themselves responsible only to their constituents. Two or three men at the home of a representative or senator can do more than 50 outsiders. The question to the representatives is not so much one of justice as it is the force that is back of the movement. It is also true that we had State organizations during the period that all attempts at securing legislation proved failures, but the proper methods were not employed to keep the organization active, healthy and progressive.

**WHY RELIEF EFFORTS FAILED.**—It is just the same with a State organization as with a local organization. At the beginning of an organization a few men feel the need of associated work and get together and form an association. They devote considerable time and money, and put forth every effort to bring about success. What is needed most and that which they must have is members. It is not so much a question of money as members—nothing can be accomplished without the membership; a few members with a fat treasury can do very little compared to a large membership with a slim treasury.

**WHAT ENERGY ACCOMPLISHED.**—I will here give you a little of the experience of our local Grocers' Association in Detroit. This organization was formed in 1896. For the first year or two our membership showed a healthy increase. The membership fee was placed at \$1. We

had no organizer, but depended entirely upon the efforts of the individual members to increase the membership, which reached about 175. Then for about one year there was but very little increase, although we had a snug balance in the treasury. Our association was then going back. While we were not securing new members, we were losing the force of our most active members, as their interest was beginning to lag. Something had to be done. After a very warm debate, we decided to raise the membership fee to \$3 and pay a liberal commission, \$2 per member, to an organizer, and in less than six months we had added over 270 members to our list, and at the same time created new life and interest in many of the old members, and the association is now in a prosperous condition.

**WHAT AN ORGANIZER DID.**—The same condition of affairs has existed in our State organization of business men, the Mercantile Association of Michigan, which two years ago did very effective work in the way of securing a revision of some of our antiquated laws at the hands of the last Legislature, our only failure arising from the fact that we were not organized on a permanent basis, and there were many sections of the State which we could not touch at all, and which, therefore, developed a fatal weakness just when needed the most. Guided by our own experience and that of other States in this matter, we secured the service of a competent organizer, fixed the initiation fee at \$3 per annum, and started the man out. This was late last fall. We now have an active, interested membership of about 1600, located in more than 30 communities all over the State, and our membership is increasing at the rate of about 50 to 75 each week, and will do so from now on until the meeting of the Legislature. This will give us 2500 members, located in more than 50 centers of population in various parts of the State of Michigan, so that when the next Legislature meets we will be enabled to exert a strong local influence on all or nearly all of the members of that body.

**PROPOSED CHANGES IN THE STATE LAW.**—We propose to ask for the following changes in the present laws, and we expect to succeed in securing a very large proportion of these changes:

1. An amendment to the general garnishment law, either by reducing the amount exempt from garnishment to \$6 per week or by the adoption of a plan based upon the Massachusetts Equitable Process law, which admits the debtor to be summoned into court and the justice or judge to become a judge of the amount he should pay upon his debts, which, by the way, is proving one of the best laws ever placed upon the Massachusetts statute books, as far as the retail merchants of the State are concerned.

2. A law to protect the legitimate established merchants from itinerant vendors of merchandise or "fly by night" merchants, a class of people against which the merchants of the East are well protected by their laws, whereas Michigan offers no protection whatever from them.

3. Better protection against the traveling peddler, and this includes the Steel Range shark, known to all the Hardware fraternity.

4. A law to prevent the transfer of merchandise stocks in bulk.

5. A law to make illegal the use of trading stamps and other gift schemes, which have done much to unsettle business and demoralize trade all over the land.

**GETTING ON A PAR WITH OTHER STATES.**—It must be understood that Michigan is not taking the initiative in any of these laws, but that other States have laws similar to these we are going to ask for already upon their statute books, and we are only endeavoring to bring the conditions under which merchants shall operate in this State up to something like a modern basis, as has already been done in many instances elsewhere.

**PLEDGED CANDIDATES.**—We believe and expect, with the membership which we will have by the time the next Legislature convenes, to be able to secure any reasonable request at their hands which our organization may make, especially as in nearly every instance the candidate for the State Legislature will have been seen prior to his election and pledges from the nominees secured in favor of the above indicated laws. The work of bringing about a reform in these matters is of gigantic proportions, and so firmly is the habit of past years fixed upon the law makers that it is only by stupendous, concerted efforts by merchants all over the State that these changes can be brought about.

The quickness with which a first-class organizer is able to interest business men in this plan is the best evidence of the great need of such work, which is slowly but surely becoming plain to the business men of this and other States, for it is only by a proper application of the old couplet, "United we stand, divided we fall," that any improvement in such matters will ever be brought about.

MISSION OF THE MERCANTILE ASSOCIATION OF MICHIGAN

GAN.—Thus far the Mercantile Association of Michigan has never attempted to take up any matters of strictly trade interest, believing that they can be better handled by such organizations as the Michigan Hardware Association, the Detroit Retail Grocers' Protective Association and similar organizations. Our work includes primarily, and at present entirely, the herculean task of revising and bringing up to date some of the musty, antiquated and thoroughly moss grown statutes under which the merchants of to-day are transacting business.

Many of you are doubtless already affiliated with the Mercantile Association of Michigan in your various towns, and others will unquestionably be asked to have a share in the work later on. We trust that in either case you will be prompt to respond to any calls for assistance, for you may rest assured that it will require every possible effort in order that we may succeed in the work before us.

The success of our last campaign was due to the energy and untiring efforts of your hustling secretary, Fred. S. Cozzens, publisher of *Trade*. To him belongs the credit, and with a proper rallying of our forces at the next session of the Legislature he will again lead us to victory.

### Train of Kitchen Furnishings.

THE train shown in the accompanying cut was recently displayed in one of the show windows of the Hardware establishment of W. K. Morison & Co., Minneapolis, Minn. The axles were ½-inch Bolts, 13½ inches

glance at the end of the year how many barrels, kegs, dozens, pounds, &c., of various classes of merchandise we have bought? Also a good form for an order book, specifying prices, discounts, deliveries, &c.?

### Trade Items.

J. F. WOLLENSAK of Chicago, who was for many years a prominent manufacturer of Hardware Specialties, is stated to have disappeared last November, and since then all efforts to find him have proved unavailing. On January 10 a business letter dated San Francisco was received from him by a Chicago insurance firm, but apart from that no word as to his whereabouts has been forthcoming since his departure in November. Mr. Wollesak is 60 years old and is reputed to be worth \$500,000. His Hardware Specialties were patented and brought him lucrative returns.

ANTHONY-BATES MACHINE COMPANY have merged their business with that of the McCloud, Crane & Minter Company, both of Worcester, Mass. The business of manufacturing Iron, Steel and Brass Milled Machine Screws, Case Hardened, Semi-Finished Hexagon Nuts, &c., will be continued under the latter style and under the personal supervision of A. H. Anthony.

SCRANTON BOLT & NUT COMPANY, Scranton, Pa., issue as an advertisement a 1900 pocket map of China in a Manila folder. The map is 15 x 11 inches in size, is indexed, and shows in addition to China, Corea, Japan, Philippines and countries on the north, west and south, together with



*Train of Kitchen Furnishings.*

long, while Pot Covers and Wire Tea Pot Stands were utilized as wheels. The engine boiler was a 50-pound Flour Bin, resting on Drip Pans, and surmounted by a gallon Milk Can for a smoke stack. Oilers did duty as cylinders, and Transom Lifts cut to proper length connected the driving wheels. The Transom Lifters were the only goods changed or damaged in constructing the train. Muffin and Drip Pans were used for the cab of the engine, and a Drip Pan and Bread Box for the tender. The cars were Drip Pans, loaded with various articles. The train was extremely simple in make up, unique in arrangement and attracted considerable attention and favorable comment. It was designed and placed in position by W. H. Kirk, a gentleman connected with the firm.

### Wanted—Form for Invoice Book.

The following inquiry comes from a house in Pennsylvania, and we take pleasure in referring the matter to the trade. It is possible that some of our readers may be able to give the desired information or to suggest some method by which the same result can be accomplished:

Can you suggest where we can get a good form for our invoice book—one that will enable us to tell at a

some statistics of interest at present. This company manufacture the Diamond "Z" brand Bolts, Nuts and Iron products, for which Patterson, Gottfried & Hunter, 146-150 Centre street, New York, are agents. A copy will be sent on application.

ROGERS SCREW COMPANY, Providence, R. I., have appointed I. J. Conger, 109 California street, San Francisco, Cal., their sales agent for the Pacific Coast.

THE WINSTED EDGE TOOL WORKS, Winsted, Conn., manufacturers of the T. H. Witherby Chisels, Gouges and Drawing Knives, whose works were burned May 19, have entirely rebuilt and have resumed manufacturing.

TROY NICKEL WORKS, Troy, N. Y., issue an illustrated hanger in colors, calling attention to their Alaska Cold Handle Pokers, Lifters, Fire Shovels, &c. On the back is an illustration of their Stove and Hardware exhibit at the Paris Exposition, which is referred to as the only one of its kind there.

R. H. Boggis, president of the Taylor & Boggis Foundry Company, Cleveland, Ohio, returned this week from a trip to Yellowstone Park.

THE NICETOWN PLATE WASHER COMPANY, Nicetown, Pa., have sold their good will and fixtures to Wheeler Lord, formerly with the American Iron & Steel Mfg. Company, Lebanon, Pa., who will continue the business under the old name, manufacturing Plate Washers and dealing in Scrap Iron of all kinds. The plant is now being remodeled and fitted up with new machinery, and will be ready for business about September 1. The new proprietor is the son of James Lord, general manager of the American Iron & Steel Mfg. Company, Lebanon, Pa.



## Indiana Retail Hardware Dealers' Association.

THE fourth semiannual meeting of the Indiana Retail Hardware Dealers' Association was held in the assembly room of the Grand Hotel, Indianapolis, on August 1 and 2. The convention was called to order at 10.30 a.m. In calling the meeting to order President Weed said that there was no set programme, and that this meeting was intended as a business meeting to keep up the interest in the organization, and that the convention would proceed at once with the roll call of the members present.

### Those Present.

The following members of the association were present:

E. M. Bush, Evansville.  
Shawhan & Boonshot, Petersburg.  
Hatfield & Calmer Company, Washington.  
M. J. Carrahan Company, Washington.  
W. H. Weed, Vincennes.  
W. W. Robb, New Harmony.  
French & Boyden, Poseyville.  
A. H. Burket, Gosport.  
H. P. Speath & Co., Aurora.  
Corey & Stephens, Argos.  
Reichenbach & Wichenheiser, Huntington.  
O. E. Lang & Co., Mishawaka.  
Lewis & Creed, New Albany.  
Stratton & Hess, Argos.  
J. L. Fulton, Portland.  
T. H. Bowen, Portland.  
Stanfield, Carlson Hardware Company, Seymour.  
F. M. Smith, Fort Wayne.  
Boyd & Adams, Letts.  
C. A. Ellis, Carlisle.  
Wm. A. Shipley, Lafayette.  
T. M. Layne, Cloverdale.  
McDaniel & Co., Winchester.  
Bridge & Weese, Huntington.  
M. Mayer, Jr., Covington.  
Frank H. Prunk, Indianapolis.  
W. E. Hinshaw, Lynn.  
A. J. Hiatt & Co., Lynn.  
Price Company, Marion.  
Nichol, Makepeace & Co., Anderson.  
Little & Oakley, Muncie.  
A. W. Smith, New Ross.  
Marion Hardware Company, Marion.  
Geo. Seybold & Co., Darlington.  
Gordon & Harmon, Indianapolis.  
Courwin & Hickam, Freedom.  
Pugh & Heaton, Indianapolis.  
J. C. Comstock, Thorntown.

Those present who were not members of the association, but who wished to join, were:

Walden & Son, Indianapolis.  
Lilly & Stalnaker, Indianapolis.  
W. H. O'Rear, Jamestown.

The minutes of the last regular meeting were read by the secretary.

At the suggestion of the president a motion was made and carried that a Question Box be made a feature of the meeting.

The convention then listened to the reports of the secretary and treasurer. The following was Secretary Robb's report:

### Secretary's Report.

Another semiannual term having expired, it is with pleasure that we submit to you a partial report of the transactions of this office. We, however, regret that want of time has prevented our noting many items that, although of no great importance, would have furnished food for thought and discussion, and we trust that the incompleteness of this report will not so greatly disappoint you as to bring forth words of censure.

We are proud to advise you that inasmuch as our growth in membership has not been what we would have it, a very much greater interest is being shown, both within our own State and throughout the country, as is shown by a large list of correspondence both from individual firms, in and out of the State, together with innumerable calls for copies of our constitution and queries as to our progress and how to proceed with local organizations.

Through the untiring efforts of your Soliciting Committee we have slowly but substantially added to our

membership, and believe that we should be flattered at the prospect for a quick and rapid growth.

As was promised by the representative of *The Iron Age*, we received (shortly after our last meeting) a number of copies of the proceedings of last meeting, at which we were instructed to mail a copy of the same to each retail Hardware dealer in the State. These instructions were complied with only in part, on account of the inadequate funds in the treasury to defray expense of postage.

We were also in receipt of a copy of the resolution adopted by the Interstate Association, also a list of the wholesale firms who were reported unfavorable to our movement, a copy of which should have been mailed to dealers in the State, but was not done for reasons above mentioned.

Again we desire to heartily thank the membership for their sincere co-operation with us in the work of this office, and are especially indebted to Messrs. Burket, Posey and Bush, who have so generously contributed their services.

As we grow older we see more and more the necessity of your best talent in this office, and not only your best talent, but one who can devote the necessary time to its requirements. At your last meeting you elected us to this office by such an overwhelming majority and applause that, despite our knowledge of our inability to properly perform the duties thereof, we accepted, resolving to do the best we could, but as we review the past and look into the future, which should crown this association with every anticipation of its members, we realize the absolute necessity of tendering to your honorable body our resignation at this time. We therefore respectfully submit the same to you and ask that you accept it, and that you make the election of a new secretary a matter of special order, to be taken up immediately after the reading and adoption of these reports.

Again thanking each and every member for favors bestowed and trusting that you will realize the necessity of making this change, we respectfully submit the above for your adoption.

As the secretary in his report placed his resignation in the hands of the convention, it was moved that the convention proceed to the election of a new secretary, but after some discussion it was decided to lay the matter over until the afternoon session, Mr. Robb kindly officiating in the meanwhile.

A number of outside merchants who were present were then given an opportunity to enroll, and two letters from E. C. Atkins & Co. were read. The first was an invitation to visit the factory and the second an invitation to a trolley ride to Fairview Park, both of which were accepted. An invitation was also read from the Indianapolis Stove Company inviting the convention to visit their factory and salesroom. The meeting then adjourned until 1.30 p.m.

At the opening of the afternoon session of Wednesday the president appointed as the Press Committee J. C. Comstock of Thorntown and W. P. Lewis of New Albany. The president announced that the first business in order was the election of a new secretary to fill out the unexpired time of Mr. Robb, or until the annual meeting in February. It was moved and seconded that Mr. Corey's name be placed in nomination. Mr. Corey was unanimously elected.

A vote of thanks was tendered to the retiring secretary for his untiring efforts in behalf of the association.

The Auditing Committee presented its report, finding that the treasurer's accounts had been accurately and faithfully kept, and that a balance of \$37.77 remained to the credit of the account of the association. The report was adopted.

### Interstate Association.

The matter of affiliating with the Interstate Association was then brought before the convention by Mr. Weed. In response to a request for information concerning the meeting in Chicago in March last, at which the Interstate Association was formed, Mr. Corey spoke as follows:

I will say this to the members of the association, that I attended there rather as a private member, not as a representative. After we came together it was decided that each State in attendance should have two representatives in the organization. The States represented at the meeting were Iowa, Minnesota, North Dakota, Wisconsin, Michigan, Indiana, Illinois, Kansas, Missouri and Pennsylvania. The meeting was held at the Sherman House and took up the better part of three days. It was business from the first to the last. I attended each session, and exhaustive discussion was had as to whether it was the proper time to organize an association of this kind, the amount of good it could do to the different State associations, what it would be called and who should become members. We accomplish a great deal of good ourselves as a State organization and can cope with a certain class of manufacturers, but the same thing might exist in a neighboring State, and until we can get together and meet as a whole we can accomplish very little. This interstate organization will have a yearly meeting. If we have a grievance in this State and find ourselves unable to settle it we refer it to the Interstate Association. The matter is then brought before that body, and the influence of every member of the Interstate Association is brought to bear to effect a settlement.

Another thing that can be accomplished by the Interstate Association. It is really an executive committee made up of the best members of each State, who map out and outline the best manner of procedure to obtain the best results. Results are what we are after, and that has been the hardest thing we have had to attain in our State organizations. They are representative, it is true, but a jobber will look at the number of dealers here to day, and he says, "I believe I can get along without them." But if we can go to the manufacturer, we can accomplish a great many of our aims. Now I have not given this matter a bit of thought. I supposed our president would come here with a full outline of this matter. My impression was that it was just the thing, and I believe we can accomplish results and that we can do a great many things that we can never perform as a State Association.

For the support of this Interstate Association each member of the different State organizations was to be assessed \$1. Michigan is the only organization that has voted since that meeting and I had the pleasure of attending the meeting in Detroit. They voted unanimously to join the Interstate Association. Indiana, with its small membership, will not pay into the association for its support nearly as much as some of the others. Iowa has at the present time over 500 members, and I believe Minnesota has more. Mr. Cole, who attended from Iowa, said that it was just exactly the thing they wanted; the thing that would help them and aid them. Now we are here for the purpose of voting on this question. It is the good we will do for our business and ourselves as members of the association that we are after, and my opinion is that we could never spend a dollar in any better way than in joining this association.

Messrs. Bush, Lewis, Weed, Robb, Comstock and Pugh also addressed the meeting, and on vote it was decided to become members of the Interstate Association, paying \$1 a year per member, this being accomplished by raising the dues to \$4 instead of \$3 as heretofore.

#### Constitution and By-Laws.

It was moved that a committee of three be appointed to revise the constitution and offer amendments to the by-laws to coincide with the requirements of the Interstate Association, and the president appointed as the committee J. S. Fulton, Portland; J. B. Pugh, Indianapolis, and E. M. Bush of Evansville.

#### Rural Delivery.

The experiences of some of the retail Hardware dealers concerning the effect of the rural delivery upon their trade were then given.

Mr. Lewis, Marion: I do not know that I can give you any information that will be of any benefit to you. But a man who was formerly a clerk for us has a route in Marion, and he made a remark to me some time since how it came that we did not sell the Hardware that he was delivering to farmers. That is all I know in regard to it.

Mr. Bush: We of Evansville are having this rural delivery, but as yet we have not been able to discover whether it is beneficial or detrimental to us. My idea is that it may develop into something like this. The farmers will commission the mail carriers to bring out certain things for them, and they having their particular

friends will go to them. Then another thing, the farmers do not go to town so frequently.

Mr. McDaniels, Winchester: I guess we have about as many free delivery routes as any town in the State, and we cannot see that it is any detriment. We think it is a benefit to us. We make sales through them, and if we have any special thing to put before the farmers we can do so by the routes. Our mail carriers drive 25 miles a day, and we think it is a good thing in our county, and we would be willing to have more, although I think we cannot succeed in getting any more, as we have about our share. On Saturday evening we have a band concert, and the programme is distributed to every farmer some time during the week, and when Saturday night comes our streets are full of farmers, and we cannot see that this stops the farmers coming to town. They will come just the same, whether they get their mail or not.

#### Parcels Post Bill.

Following this discussion the secretary read a letter from Z. T. Miller, Bloomington, Ill., president of the Interstate Retail Hardware Association, concerning the Parcels Post bill, introduced in Congress, and a motion was made that each individual member of the Indiana Retail Hardware Association write a letter to his Congressman urging him to oppose the passage of this bill. The motion was carried by a rising vote.

It was then moved that a committee be appointed to draft a resolution to send to their United States Senators and Congressmen, urging them to oppose the passage of this bill, and the president appointed Mr. Lewis of Marion, Mr. Gordon of Indianapolis and Mr. Boonshot of Petersburg. The resolution adopted, which was presented on Thursday morning, was as follows:

*Resolved*, That the Indiana Retail Hardware Dealers' Association are opposed to the passage of the Pettigrew Postal and Parcels bill, that it would benefit but a small class and be detrimental to the business of the people generally, and that the secretary be instructed to send a copy to each Senator and Congressman, asking them to vote for the defeat of the bill.

#### Catalogue Houses and Department Stores.

At the evening session the question of catalogue houses and department stores was discussed. E. W. Clark of E. C. Atkins & Co. addressed the meeting as follows:

It is a pleasure for me to address you. The subject of catalogue houses and department stores is one which has been brought up in other meetings, both of jobbers and retail associations, at which I have been present, and I believe I can safely say that they are indeed a menace to the legitimate Hardware dealer.

The retail dealer is the only proper channel through which Axes and high grade implements should be sold. We recognize that, and for years have adopted the policy of agreeing to not only not sell to the catalogue houses, but we also say that we will agree to see that they get them from no other sources. A catalogue house will list articles that they sell at from 5 to 7½ and 10 per cent. below that which the retail Hardware dealer obtains. They can do that for two reasons: First, because they sell for cash, for they obtain cash in advance; secondly, because they buy in large quantities, and from some manufacturers obtain better terms than retail dealers do. An association of retail Hardware dealers in proper organization can dictate whether manufacturers can sell to them or sell to the catalogue houses.

We heartily sympathize with the retail dealers. They are the people who have built up our trade to its present magnitude. We realize that they handle fine goods. The department houses as a rule only buy those goods which are known to the public as staple goods, sell them at a low margin, and then handle other cheap goods which are unknown, which have no standard brands, and from which they obtain a large profit that is far out of proportion to any legitimate profit that a Hardwareman would expect.

I might say that I know it is the intention of our company to not only avoid selling to catalogue houses and department stores, but also to assist and co-operate with the retail dealers, not only in Indiana, but throughout the entire country, in obtaining a legitimate profit on our goods, and in conducting their business so that it will be entirely satisfactory to them in every way. If in any way our house can be used as an example to show that we intend to assist the legitimate trade, we will at all times be glad to have not only this association, but any other association, point out E. C. Atkins & Co. as the friend of the retail dealer.



We also intend to protect the jobber. And the jobber should protect the retail dealer, for it is as much to his interest as it is to the interest of the manufacturer.

It was then moved that a vote be taken to get the sense of the meeting as to the wisdom of members handling goods sold by catalogue houses and department stores, or handling goods sold exclusively by legitimate retail dealers. The vote was unanimously in favor of handling only goods handled exclusively by retail dealers. Adjournment was then had until Thursday morning.

At the Thursday morning session the bill of Mr. Robb for six months' services as secretary was presented and allowed. The secretary reported that he had a balance on hand to turn over to the new secretary, after making collections and paying some bills.

A resolution was presented that the next annual meeting be held at Indianapolis and that a committee of five be appointed to make the necessary arrangements for the same.

A resolution was also presented that a committee of three be appointed for the formulation of a programme for the February meeting. Both resolutions were adopted.

The Committee on Constitution and By-Laws then reported. The articles in the constitution were read and acted upon separately. The constitution and by-laws as read and accepted were as follows.

#### **New Constitution and By-Laws.**

##### **PREAMBLE.**

The Indiana Retail Hardware Dealers' Association is an organization intended to include in its membership all legitimate dealers in Hardware in the State of Indiana, who conduct their business in a manner not prejudicial to the general welfare of the Hardware trade; all membership being subject to the approval of the Executive Committee before final acceptance. The trade has long recognized the necessity for co-operative work in protection against trade abuses. It is the purpose of the Indiana Retail Hardware Dealers' Association to furnish such protection as far as is possible. As such protection is only obtainable through the medium of a large and interested membership, we earnestly invite the attention of all dealers who are not members to the end that they may see the necessity of joining their influence to ours in this work.

##### **RESOLUTIONS.**

*Whereas*, Some manufacturers and wholesale dealers in general Hardware, Stoves, Tinware and kindred lines persist in selling their lines through illegitimate channels to our injury and detriment, placing us toward our customers in the light of extortioners, causing endless trouble, and

*Whereas*, The system of protecting us from this wrong is ineffective, it is absolutely necessary to perfect such a system by united action, which will remove these evils from which we have suffered for years. Therefore, be it

*Resolved*, That the members of this association confine the purchase of Hardware, Stoves, Tinware and kindred lines, as far as practicable, to manufacturers and wholesale dealers who sell goods to firms that are regularly engaged in the retail Hardware business, as defined in these resolutions.

*Resolved*, That it is the sense of this association that the interpretation of the term "retail Hardware dealer," as set forth in the above resolution, to entitle him to purchase Hardware, Tinware and kindred lines, be construed to mean any person having an established place of business and carrying a line of Hardware, Stoves, Tinware and such goods as are usually kept in a first-class Hardware store; excepting in places where there are no regular Hardware stores. General stores who do not use the line in a way that demoralizes the trade, and any other store not objectionable to the regular dealers in such territory, shall be construed as legitimate.

*Resolved*, That it is not the intention of the above resolutions to prevent the interchange of goods mentioned between manufacturers and wholesale dealers in such goods, or for export trade, and that the further interpretation of these resolutions is hereby vested in the Executive Committee with power. The following are exempt from these resolutions: The United States Government, railroads and such manufacturing industries and companies as the Executive Committee may approve, for such goods as are necessary for their respective lines of business.

*Resolved*, That any manufacturer or jobber in Hardware, Stoves, Tinware or kindred goods furnishing net prices or any discount from list prices, contrary to the foregoing resolutions, either by themselves, employees

or agents, shall be considered as disapproving the above resolutions.

*Resolved*, That this association shall, as far as it lies in its power, keep a record of all goods sold, and by whom sold, through illegitimate channels, and of all other violations of these resolutions.

*Resolved*, That every member of this association is constituted a committee of one, and is expected to report to the proper officers any violation of these resolutions.

*Resolved*, That it is the sense of this association that bids direct to consumers or contractors by jobbers or manufacturers, upon any kind of finishing or rough Hardware entering into the construction of buildings, is injurious to the retail trade, and that all such bids should be made by or through a regular Hardware dealer.

*Resolved*, That all meetings of the State association should be closed meetings, and that the published reports of the proceedings of same should be under the supervision of a press committee.

*Resolved*, That these measures are just and necessary for our welfare, and it is expected that their rigid enforcement will be observed.

*Resolved*, That this convention indorses the above, and urges its officers to use their best efforts to bring about the further formation of State associations so as to insure a greater national association, with the end in view that a uniform system of protection for the trade will prevail throughout the country.

#### **ARTICLE I. NAME.**

The name of this organization shall be the Indiana Retail Hardware Dealers' Association, branch of the Interstate Association.

#### **ARTICLE II. OFFICERS.**

The officers of this association shall be: One president, one vice-president, one secretary and treasurer, who shall be elected at the regular meeting in February of each year.

#### **ARTICLE III. ORDER OF BUSINESS.**

The order of business shall be.

1. Roll call of officers.
2. Reading of minutes of last regular and call meetings.
3. Reports of committees.
4. New or unfinished business.
5. Propositions for the good of the association.
6. Adjournment.

#### **ARTICLE IV. MEETINGS.**

The regular meetings of this association shall be held annually, on the first Wednesday of February of each year, at such place as the members present at any regular meeting may decide.

#### **ARTICLE V. MEMBERSHIP.**

Any person or company who is now or shall hereafter engage in the retail Hardware business, and carry a full and complete assortment of the same, may become members of this association by making application to the secretary and paying into the treasury the amount of dues prescribed in the by-laws.

#### **ARTICLE VI. ADMISSION FEE AND DUES.**

The admission fee to membership shall be \$4, payable in advance, which fee shall include the dues until the regular meeting in February following. The annual dues shall be \$4, payable at each regular meeting in February.

#### **ARTICLE VII. COMMITTEES.**

The president shall appoint a committee of three, who shall, together with the president and secretary, constitute an Executive Committee. He shall also appoint an Auditing Committee of three, who shall serve during his term of office.

#### **ARTICLE VIII. DUTIES OF OFFICERS AND COMMITTEES.**

Section 1. It shall be the duty of the president to preside over all regular and called meetings, to exercise supervisory control over the affairs of the association, to carry out and enforce all measures adopted by the association, and to fill all vacancies in the offices by appointment.

Sec. 2. It shall be the duty of the vice-president to officiate for the president in his absence or disability.

Sec. 3. It shall be the duty of the secretary and treasurer to keep accurately the minutes of all regular and called meetings of the association, to keep correctly the account of all money received and disbursed, to issue certificates of membership to all members and to render a correct account of the same to the association at its regular meetings, and perform such other duties as may be requested of him from time to time.

Sec. 4. It shall be the duty of the Executive Committee to take charge of and settle all questions of dispute

or otherwise that may be referred to them, to act in conjunction with the president in the general supervision over the association, and to make report of the same at the next regular meeting.

#### ARTICLE IX. VOTING.

Section 1. Each person or firm holding membership shall be entitled to one vote only on all subjects and at the election of officers.

Sec. 2. All questions introduced by motion shall be decided by a majority vote of all members present.

Sec. 3. All changes in the constitution and by-laws shall require a two-third majority vote of all members present.

#### ARTICLE X. AMENDMENTS.

Thirty days' notice shall be given to the association of any proposed change in the constitution and by-laws, except in cases of emergency, when the rules may be suspended by a majority vote of all members present and such changes taken up for immediate action.

#### ARTICLE XI. QUORUM.

Ten members in good standing in the association shall constitute a quorum.

Three members of the Executive Committee at called meetings shall constitute a quorum.

#### ARTICLE XII. REPRESENTATION.

All persons, firms or companies holding membership shall be represented at any regular or called meeting in person and not by proxy.

#### ARTICLE XIII. OFFENSE.

In case of a violation of the resolutions of this association by any Hardware manufacturer or jobber, thereby affecting the business of any member of this organization, the member thus affected shall call on or correspond with such manufacturers or jobbers and endeavor to adjust the same, and if not satisfactorily adjusted, he shall then notify the secretary of his action, giving sufficient evidence as to the facts in the case, who shall immediately take the matter up, and if not then adjusted, the secretary shall present the matter to the Interstate Association for adjustment, and if not satisfactorily settled shall notify each and every member of the association, who shall discontinue to patronize such manufacturer or jobber.

#### ARTICLE XIV.

By subscribing to the constitution and by-laws, the person, firm and corporation thereby agrees and is pledged to conduct his business in accordance with the same. He also agrees to carry out explicitly all requests of the Executive Committee, especially in matters relating to the violation of the constitution and by-laws by jobbers and manufacturers or resolutions adopted at any regular meeting of the association.

Mayor Taggart of Indianapolis was then introduced and made a brief and felicitous address, to which an appropriate response was made by President Weed.

#### QUESTION BOX.

The Question Box was then opened and some discussions followed on the questions thus brought up. Among them were the following:

What does this association think of our present bankrupt law?

Shall a lumber dealer who handles Hardware be made a member of the association?

What is your reason for joining this association?

What effect has the co-operative telephone on the retail Hardware business?

What will become of the Implement and Hardware trade as to the Implement part of it?

How can the cutting of prices on 10, 20 and 25 cent goods be regulated?

Do you use a cash register?

How many simply use the ordinary till for handling cash?

How many use the cash carrier system?

Would it be a good thing to send out a young man to obtain members for this association, giving him a commission of \$1 for each new member?

What constitutes a grievance against the association?

The convention extended a vote of thanks to E. C. Atkins & Co. for the royal manner in which they had treated the association while in the city, to the Mayor for his remarks and a box of fine cigars, to the Indianapolis Stove Company and to all others who had extended courtesies to the members of the convention.

After a discussion of the ways and means of obtaining new members the convention adjourned.

#### CONVENTIONALITIES.

W. P. Lewis of New Albany is talked of as a likely candidate for the presidency at the February election of the association.

E. M. Bush of Evansville won the esteem of all by the masterly manner in which he entered into the various discussions that came up.

M. L. Lewis of Marion created somewhat of a surprise by asking the members during the meeting whether they would be in favor of accepting a balance of \$50 that was in his possession since acting as treasurer of a former Hardware association which did not now exist. After recovering from their surprise the members unanimously voted in favor of accepting it.

Too much cannot be said in praise of E. C. Atkins & Co., Indianapolis, for the clever manner in which they entertained the members. On Tuesday afternoon the entire body were escorted through their large Saw factory and to each one was explained the method of producing Saws. As they passed out a handsome souvenir in the form of a pocket memorandum book was handed each person, after which the entire group were photographed. On Thursday afternoon a trolley ride to Broad Ripple Park was taken and an enjoyable trip on the steamer "Sunshine" up the White River indulged in, after which refreshments were served and the visitors taken back to the hotel.

N. A. Gladding, the genial secretary of E. C. Atkins & Co., took an especial interest in seeing that every one was made to feel perfectly at home while in Indianapolis, even going so far as to instruct Mayor Taggart to hand over the town to the visitors.

Brother Boonshot of Petersburg was ever ready and willing to contribute his share toward making every one happy, and his pleasant smile was the hit of the convention.

President Weed, while a rather quiet and modest person, nevertheless is an indefatigable worker for the good of the cause.

Secretary Robb is without doubt one of the most active officials that an association ever had, and while not oratorically a Chauncey Depew, nevertheless can rise to the occasion when it is necessary to state facts for the good of the association.

A. W. Burket of Gosport made a most efficient sergeant-at-arms, and saw to it that none but members were admitted.

J. L. Fulton of Portland took a lively part in the proceedings, being a strong advocate of the abolishment of the department store.

C. A. Ellis of Carlisle never let an opportunity go by to explain the merits of the Little Giant Scythe Brace.

It was the unanimous opinion of all members present that Brother Corey will prove a most valuable aid to the association as secretary, being well qualified for the position.

A. T. Slayter, Chris. Krelger and Lloyd Slayter have purchased the Hardware and Implement stock and business of L. J. Hess (formerly Slayter & Hess), Argos, Ind., and will continue at the old stand under the style of Slayter Hardware Company.

Wallace & Horner, Hardware merchants, Leon, Iowa, dissolved partnership on the 24th ult. T. E. Horner has purchased Mr. Wallace's interest and will continue at the old stand.



## The Retail Hardware, Implement and Vehicle Association of the Indian Territory.

THE long cherished plan of the retail Hardware and Implement dealers of the Indian Territory to organize themselves into a territorial association was accomplished on the 12th ult., when a very considerable number of the leading retail dealers from all parts of the Territory met in the Commercial Club in South McAlester and organized the Retail Hardware, Implement and Vehicle Association of the Indian Territory. The meeting was called to order by Thomas Hale of Durant, who has been the prime mover in working up the association. After stating briefly the object which had prompted the effort to form the association, and some of the benefits which it was hoped to accomplish through such concert of action, the meeting was organized by electing J. G. Garland of Muskogee temporary chairman, and A. F. Robertson of Dallas temporary secretary.

The following resolution was offered by Deck Miller of Poteau:

*Resolved*, That we, the retail Hardware and Implement dealers of the Indian Territory here assembled, do organize ourselves into an association for the mutual protection and advancement of our branch of the trade in this section of the Southwest.

Following the offering of this resolution, remarks favorable to the organization of such an association were made by a number of those present, and the resolution was unanimously adopted.

A permanent organization was effected by electing Thomas Hale of Durant president, and Deck Miller of Poteau, secretary.

A constitution and by-laws, similar to those of the Texas association, were read and adopted, section by section.

Any person or firm engaged in the retail Hardware, Implement and Vehicle trade in the Indian Territory and carrying a full and complete stock of this class of goods is eligible to membership upon paying a fee of \$3.

Any person representing any Hardware or Implement jobber or manufacturer, travelling or residing in the Indian Territory, is eligible to membership upon the payment of a fee of \$5. Such members shall have the privilege of the floor for discussion, but shall have no vote in the meetings.

The date of meeting shall be the second Monday in April of each year. The Executive Committee consists of seven members, the president, secretary and five members from the body of the association. Fifteen members constitute a quorum for the transaction of business.

After the adoption of the by-laws the additional officers of the association were elected as follows: First vice-president, J. B. Spraggins of Ardmore; second vice-president, I. P. Smith of Caddo; and Clarence Turner of Muskogee, treasurer.

The five other members of the Executive Committee were appointed as follows: Samuel Frazee of Vinita, Dr. Bevins of Ardmore, J. G. Smith of South Canadian, Fred Parkinson of Wagoner and A. S. Gilkie of Chickasha.

The members of the Grievance Committee are Ed. Williams of Claremore, J. B. McAlester of South McAlester and Robert Barring of Purcell.

The Insurance Committee is as follows: R. K. McAdams of South McAlester, S. Noble of Ardmore and W. A. Ward of Antlers.

### Resolutions.

The following resolutions were read and adopted:

*Resolved*, That we, the Retail Hardware, Implement and Vehicle Association of the Indian Territory, assembled in this, our first convention, congratulate ourselves upon the success with which the organization has been inaugurated. That the future and continued success of this movement depends upon the unanimous and enthusiastic support of the dealers of the Territory, we urge every retail Hardware, Implement and Vehicle Dealer in the Indian Territory to unite with us in form-

ing one of the most successful associations in the country. That we extend our greeting to the like associations in our sister States, and pledge to them our earnest support and co-operation in every effort to advance the interests of the retail Hardware, Implement and Vehicle trade of the country. That we urge all wholesale dealers and manufacturers in general Hardware, Stoves, Tinware, Granite Ware and Queensware, whose interests are identical with our interests, and whose goods are marketed largely through our channels, to co-operate with us in every way possible to restrict the sale of their goods to the retail Hardware, Implement and Vehicle trade. That we are heartily in favor of the organization of a National Hardware, Implement and Vehicle Association.

*Resolved*, further, That the members of this association confine the purchase of Hardware, Stoves, Tinware, &c., to manufacturers and wholesale dealers who sell goods only to firms that are regularly engaged in the retail Hardware business.

*Resolved*, That any manufacturer or jobber in Hardware, Tinware, Stoves, Implements, Vehicles or other merchandise usually carried by retail Hardware dealers, furnishing net prices contrary to the foregoing resolution, either by themselves, employees or agents, shall be considered as disapproving the above resolution.

*Resolved*, That this association shall, as far as it lies in its power, keep a record of all goods sold, and by whom sold, to catalogue houses and department stores and all other violations of these resolutions.

*Resolved*, That every member of this association is constituted a committee of one, and is expected to report to the proper officers of this association any violation in his section of these resolutions.

*Resolved*, That any member of this association purchasing goods from any manufacturer or jobber who has been listed by the Executive Committee as disapproving of these resolutions shall be subject to a fine or expulsion, at the discretion of said committee.

*Resolved*, That these measures are just and necessary for our welfare and a rigid enforcement is demanded.

*Resolved*, That this convention indorse the above and urge its officers to use their best efforts to bring about the formation of a National Association, with the end in view that a uniform system of protection for the trade will prevail through the entire country.

Muskogee was selected as the next place of meeting, and the association adjourned.

## Requestss for Catalogues, &c.

**B**UILDERS' SUPPLY COMPANY, Indianapolis, Ind., are moving into their new four-story building, 342 E. Washington street. They are also adding to their former line of Builders' Hardware a general line of Hardware and a Mantel and Tile department. The company would be pleased to receive catalogues and price-lists from manufacturers.

Samuel H. Fisk, formerly in the commission business at Monterrey, Mexico, has associated himself with C. Holck & Co., Monterey, and will manage their Machinery department. Mr. Fisk advises us that the firm would be glad to receive from the Machinery and Heavy Hardware trade catalogues, quotations, &c., relating to these lines.


A. Grimwood & Co., in the general commission line at Mexico and Vera Cruz, are about to start in business at Merida, Yucatan, as importers of Hardware and Machinery such as will be needed in Yucatan. They would like copies of catalogues, price-lists, &c., from manufacturers and jobbers, addressed to Merida.

## Morse Twist Drill & Machine Company's New Catalogue.

**M**ORSE TWIST DRILL & MACHINE COMPANY, New Bedford, Mass., have recently issued an illustrated and descriptive catalogue of their entire line of goods, consisting of 129 pages. In it are shown a great variety of Increase and Constant Angle Twist Drills, Chucks, Reamers, Milling Cutters, Taps and Dies and Machinists' Tools, for which this house is well known. Attention is called to the fact that the plant of the T. & B. Tool Company, Danbury, Conn., purchased by them in 1898, has been removed to New Bedford, where it is now being operated. The style of drill formerly manufactured by the T. & B. Tool Company will still be furnished under the name of Constant Angle, particulars of which are given in the catalogue.

## Iron Pump Manufacturers' Association.

THE midsummer meeting of the Iron Pump Manufacturers' Association, held at the Auditorium Hotel, Chicago, last week, was both pleasant and profitable to the members in attendance. If any hotel in this or any other country can beat the Auditorium in getting up and serving a banquet such as the Pump men are supposed to have had on Wednesday evening, August 1, then *The Iron Age* does not possess an up to date knowledge of the science of gastronomy. A copy of the menu had fallen into the hands of one of our staff, but when interrogated regarding it W. F. Deming, president of the association, discreetly maintained his own veritable sphynx-like expression, "sawed wood," and refused to be "pumped." Our ubiquitous correspondent, however, like a detective, after traveling miles and miles ferreted out the author's identity and whereabouts, interviewed



Banquet of the  
National Association  
of  
Iron Pump  
Manufacturers  
of the  
United States

Given at the  
Auditorium Hotel,  
Chicago,  
Wednesday, Aug. 1,  
1900  
at 8 o'clock P. M.

Toast Master,  
His Royal Micks  
Alternate,  
Getting Frisky Ross

Pump "Spouts" at irregular intervals by garrulous members

"Sufficient unto the day is the evil thereof."

### Menu.

#### HUITRES.

Little (Rubber) Neck Clams  
with Prestidigitative Digestion Sauce  
à la Sleight.

#### POTAGE.

Purée of Goose Neck  
à l'Association.

#### POISSON.

American C. O. D.  
with Cream of Eggs (acting) Dressing  
à la Morrison.

#### VOLAILLES.

Squab (ble) on Trust  
à la Ward.

Braised American Eagle  
à la Trahern.

#### ENTRÉE.

Spit-fried Chinese Pig  
with Peking (on trade) dressing  
à l'Armée Américaine  
White Elephant Cutlets,  
with French Peas (?) and International  
Bellicose Sauce.

#### VIANDES.

Phil (up) of Beef,  
Mucn-room Sauce à la Myers.  
Roast (16-2-1) Lamb  
with U. S. Mint Sauce  
à la Go(u)ld.

#### LÉGUMES.

Boston (¼ Baked) Beans  
Potatoes in Jackets—Straight  
Tender Asparagus—Tips  
Celery, Beets, Peas—To Waiters.

#### SORBETS.

Champagne Punch  
à la Deming.  
Real Pain Punch  
à l'Association.  
Punch au Rhum—see?

## Price-Lists, Circulars, &c.

E. C. ATKINS & Co., Indianapolis, Ind.: Wood Saws, A pamphlet illustrating the Atkins Wood Saws in colors, contains prices and descriptions of this line of the concern's products.

WESTERN MALLEABLE & GRAY IRON MFG. COMPANY, Milwaukee, Wis.: Chair Irons, Stool Irons, Furniture Castings, &c.

JAMES C. LINDSAY HARDWARE COMPANY, Pittsburgh, Pa.: Illustrated catalogue No. 16. This is devoted to Firearms, Ammunition, Sporting Goods and Cutlery.

WILCOX MFG. COMPANY, Aurora, Ill., and 168 Church street, New York: Illustrated catalogue of Door Hangers and Hardware Specialties, including a great variety of Door Hangers for various purposes, Overhead Carrying Track Systems, Ball Bearing Ladder Fixtures for stores, &c., Door Holders, Latches, Barn Door Stay Roll-

### Liquidations.

\*Aqua Pura Distillate  
Deep Rock, Drilled Well

Conquest Sherry,  
from Cellars of our "Cath  
in Spain."

Bordeaux,  
Mixture (special import)

Champagne,  
Pumper-hide-and-sock

Fish-House Punch,  
on the side (in case)

Scotch High Balls,  
Usher's Best,  
caught on the

Mixed Drinks  
imbibed on the

\*Continuous Flow Artesian  
Water  
on draught at the Pump

\*For Prohibition members  
N. B.—The "Gastronomic" Sp  
ach Pumps (valve constructed  
ber balls, glass seat—patent ap  
for) in Banquet Hall Lave  
Experienced operators in charge

Floral decorations from the  
and from the Conservatories of  
members, whose names are  
quest withheld.



#### GIBIER.

Barbecued Mountain Ram  
with Hydraulic Gravy  
à la Douglas-Chase.

Fricassée of Kangaroo Tails  
garnished with Eucalyptus leaves  
à l'Exportation.

#### SALADES.

Combination,  
sprayed with Standard Oil Dressing  
à la Henion.  
Water Cress and Water Lily  
à la Wade.

#### DESSERTS.

Cosmopolitan Egg Custard  
with Whipped Cream and Beet Sugar Sauce  
à la Barnes.

Twentieth Century Ice Cream  
with Expansion Puffs and U-tak-a Cake  
à la Blowers.

#### Public-Works Plums

Push the button, the tree does the rest.

Raisins, Old Stilton Cheese,  
C. D. J. Peanuts, Water Bent Crackers,  
Chestnuts Uneeda (Rest!).

#### Open-Door Coffee,

Pan-American Brandy,

Uwanta Chinese Ginger—sugared.

#### FUMER.

Social Smokes ad libitum.

Pipes—Adjustable Suction,

Manila Navy Straight Cut,

Cigars—Reciprocity, "Cuban Maid,"

High Duty.

him and learned that the menus were hastily issued, several toothsome dishes having been served *sub rosa* and not having been printed on the bill of fare. "Every man has his price," and we have settled for copyright in full with the author, who acknowledges that his "after thoughts" are better than his "foresight," and that his funny bone and humorous vein have been of slow growth, following a difficult surgical operation for their insertion, insisting that he was born without these adjuncts. We present herewith the revised menu in full, but are still in doubt as to whether same is FACT or MYTH.

## Wheeling Corrugating Company's Catalogue.

THE WHEELING CORRUGATING COMPANY, Wheeling, W. Va., and 47 Cliff street, New York, have issued a catalogue devoted to Metal Ceiling Plates, Molds, &c. An increased number of embossed metal patterns are shown in this new catalogue, which is accompanied by a price-list. The company prepare suggestive sketches and estimates from plans.

ers, Hasps, Staples, Corner Irons, Hand Rail Brackets, Lawn Mower Sharpeners, Bench Stops, Twine Cutters, Corn Huskers, Foot Scrapers, &c.

H. ADLER COMPANY, Pittsburgh, Pa., and 105 Beekman street, New York: Fall and winter catalogue No. 32 of Gas Stoves, Hot Air Heaters, Portables, Natural Gas Burners, Burner Fronts, Sheet Iron, Brass Fenders, &c.

### Atlas Pipe Wrench.

THE home office of the Atlas Pipe Wrench Company, whose Atlas Pipe Wrench we gave an illustrated description of in our issue of August 2, is in 51 Flood Building, San Francisco, Cal. The company's New York office is at 121 Liberty street. The Wrench is provided with a swinging jaw, which by swinging into one of the three slots is adjusted for different sized pipe. Thus by swinging the jaw into the slot nearest the handle the Wrench is adapted to the smaller sized pipe. The next slot is for medium sized pipe and the third slot for still larger sizes.



## The Wilke Porcelain Refrigerators.

The illustrations of refrigerators given herewith represent two of the line of porcelain refrigerators made by the F. A. Wilke Company, Anderson, Ind. The refrigerators are tile lined inside and outside, including the ice chamber, the latter so protected, it is explained, that

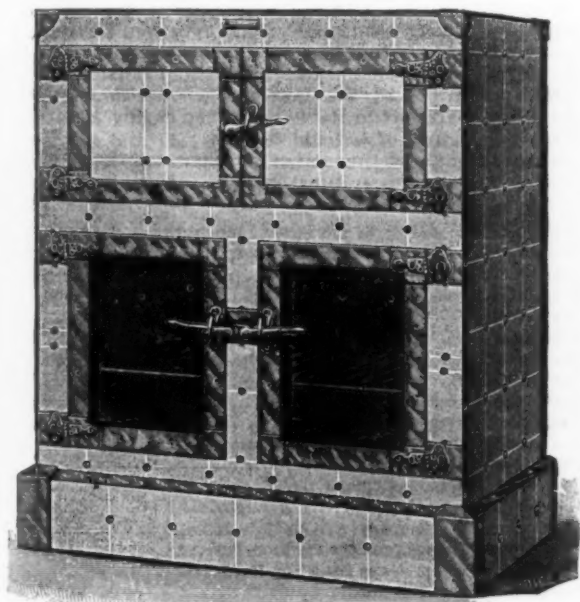


Fig. 1.—Wilke Porcelain Refrigerator No. 10.

when the ice is put in it does not strike the tile. Walls are lined with a 4-inch course of mineral wool on the bottom, top, sides and back. The front is covered with tile, except the doors, which have a polished frame of metal, nickel plated, with double plate glass in each door or tile on both sides, as the cuts may show. There is nothing cheap about these refrigerators, the manufacturers remark, not even the price. The point is em-

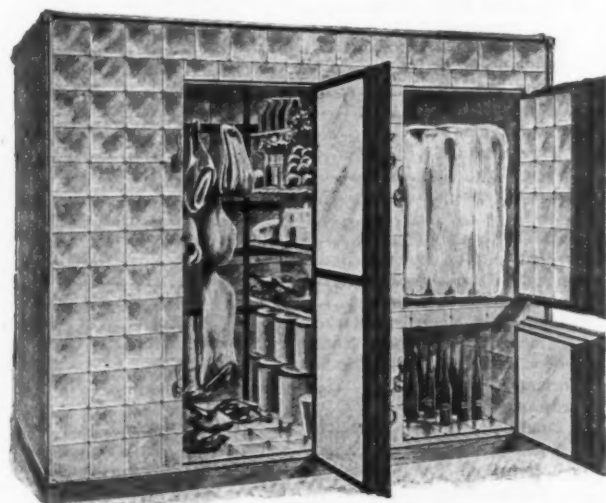


Fig. 2.—Wilke Porcelain Refrigerator No. 25.

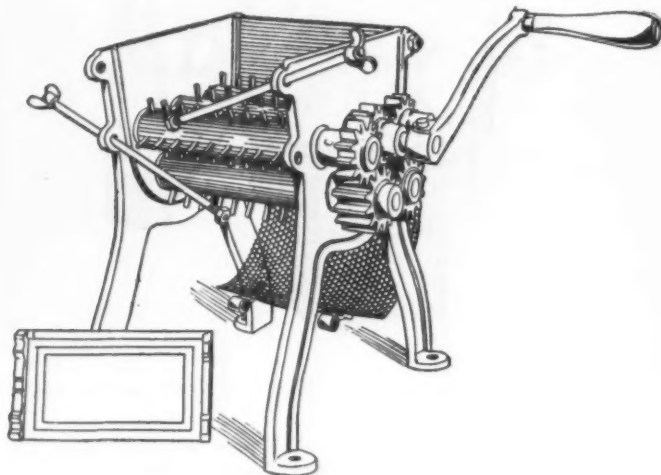
phasized by them that there is no zinc in the ice chamber nor in the provision chambers. Fig. 1 represents a refrigerator designed for use by a family of five or six persons. A larger size is made of the same style, catalogued as No. 12. In Fig. 2 a style of refrigerator is shown which is built to order in any size.

Foot & Becker, Scranton, Pa., who began business April 1, 1899, dealing exclusively in Builders' Hardware and Builders' Supplies, report a very satisfactory trade. They have recently begun to handle Glass.

Wm. F. Allen has disposed of his stock of Hardware, Stoves and Sporting Goods, at Superior, Neb., to T. J. Burgess, who continues at the old stand.

## Lee's Bread Crumber.

Goodell Company, Antrim, N. H., and 10 Warren street, New York, have just put on the market Lee's bread crumber, a sectional view of which is here shown. This kitchen device is designed for crumbing bread for cooking purposes to supersede the use of cracker meal, to which it is said to be far superior as well as much more economical on account of the quantities of bread 24 hours old always available. It is unnecessary to dry the bread before crumbing. The moisture in soft bread crumbs in frying emits sufficient steam to prevent the absorption of grease, another feature being a handsome brown which crumbs of this character take in frying. There are five shafts running across to the ends of the hopper, provided with radial crumbing or tearing fingers, which are arranged so that the fingers of the several shafts mesh with one another. The ends of the shaft project through the end pieces and are provided with



Lee's Bread Crumber, Sectional View.

gears, which engage with one another so that the shafts are rotated when power is applied to the middle shaft of the upper series. By reference to the sectional view the direction of rotation of the several shafts will be apparent. The middle gear of the upper series meshes with the gear on the right in the upper series and the gear shown on the shaft to the left in the lower series. The gears of the lower series mesh with each other, and the upper and lower gears on the left of each series also mesh with each other. The gearing which connects the several shafts is so arranged that the two outer shafts of the upper horizontal row rotate from the center of the hopper outwardly, and consequently in opposite directions, while each of the two lower shafts rotates in the same direction as the upper shafts in the upper row just above it. By this arrangement of gearing the material to be crumbed is drawn down by the crumbing fingers of the two outer shafts in the upper row and is there seized by the crumbing fingers of the two lower shafts and forced to the bottom. If the crumbs are fine enough they pass through the perforations in the sieve at the bottom and fall into a suitable receptacle. If the pieces of bread are too coarse to pass through the sieve, they are carried again by the two lower shafts and thrown up to the central shaft and one of the outer shafts to be carried to the top of the hopper again, and thence to the crumbing action of the fingers a second time, and so on until the required fineness is attained. It will thus be seen that the material has no chance to escape the action of the tearing fingers, but is kept passing through the machine until thoroughly crumbed.

A feature to which particular attention is called is the fact that fresh bread can be crumbed, this being a much better medium for the cooking of croquettes, fish, chops, cutlets, escalloped oysters, fried oysters, clams, &c. It also affords an opportunity to use up what would otherwise be thrown away or sold for very little. This machine can also be utilized for crumbing cake for the making of various puddings, &c., and can also be used for pulverizing crackers. Several sizes of sieves are furnished with each machine.

The illustration shows the front plate disconnected and the sieve dropped downward to give a view of the crumbing cylinders. The crumbers are made in three sizes: No. 20 for hand use, No. 30 for hand or power, and No. 40 for power.

A. F. Hitchcock in the Hardware business at Panama, Neb., has admitted a partner, and the style is now Hitchcock & Hamilton.

### Ogden Automatic Liquid Door Check.

The Ogden Mfg. Company, Newark, N. J., for whom Wm. H. Quinn & Co., 103 Chambers street, New York, are general agents, have recently put on the market the Ogden liquid door check and spring, as here illustrated. The principal feature of this check is an automatic regulating valve on the inside of the check which regulates and fully controls its action and the movements of the door at all times and under varying conditions. It obviates the use of a small regulating screw and is said to properly govern the action of the check even if the wind

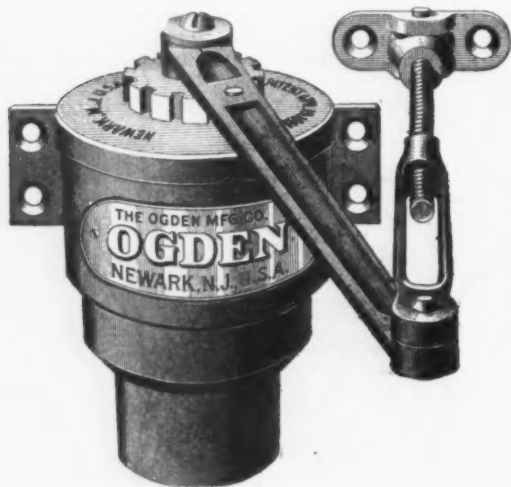


Fig. 1.—Ogden Automatic Liquid Door Check and Spring.

blows 40 miles an hour. The main working parts are drop forged from steel. Every part is machined to fit and interchangeable throughout. A specially prepared non-freezing oil is used for the liquid in which all the working parts are immersed and revolve in when the check is in use, thereby assuring proper lubrication and reducing the wear to a minimum. Another feature is that the action of the door is controlled by the check during its entire swing. The door may be opened without any checking resistance at any angle from 5 to 180 de-

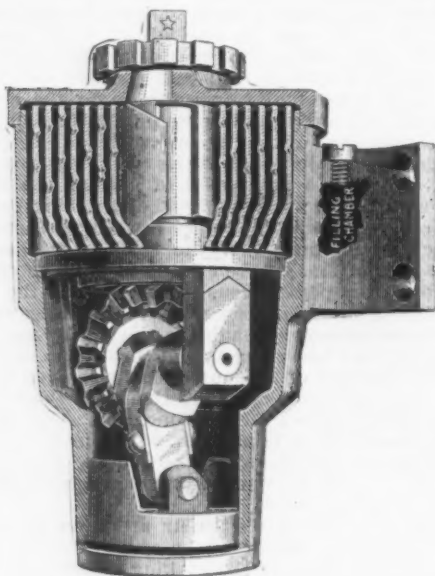


Fig. 2.—Sectional View of Checking Mechanism.

grees. The moment the door begins to close, the check, it is said, actually begins to work, the checking power gradually increasing as the closing point is reached, thereby giving a smoothness in closing peculiar to this check. A self contained coiled spring which is easily removed from the case is used. To change from right to left, or vice versa, it is only necessary to remove the spring from the case, invert the spring and return it. The check contains double the supply of liquid necessary to operate it, there being no holes through the cup where the liquid can escape. Fig. 1 shows the device ready

for application, Fig. 2 being a sectional view showing the interior mechanism of the check.

### Dobler's Fasteners.

Walter W. Woodruff & Sons Company, Mount Carmel, Conn., are manufacturing Dobler's fasteners, for use on stationary outside window screens, storm windows and shutters. The fasteners are referred to as being particularly desirable where wooden shutters are used, inclosing a building for an entire season, as they do not admit of the shutter being opened from the outside. A feature of the fastener is that no screws or screw eyes are left in the ledge of the casing to interfere with the sliding of outside screens.

### CONTENTS.

	PAGE.
The Eberhardt Sand Mixer and Sifter. Illustrated.....	1
Glimpses of the British Iron Industry.—I.....	2
Lake Ore Matters.....	4
New Water Works at Constantinople.....	4
The Castner Electrolytic Plant at Niagara Falls.....	5
The Stover Deep Well Gasoline Pumping Engine. Illustrated.....	5
The International Congress on Testing Materials of Construction...	6
The Tin Plate Scale.....	9
Pacific Coast News.....	10
Wm. Cramp & Sons' Annual Report.....	10
The Roebling Exhibit at Paris. Illustrated.....	11
The Throw of a Crank—What Is It?.....	11
The Talbot Process in England.....	11
The National Tube Company.....	12
The Sharon Steel Company.....	13
Industrial Depressions and the Pig Iron Reserve.....	14
The Clergue Enterprises at Sault Ste. Marie.....	15
The Contract for Field Guns.....	18
The Belmer-Eames Planer. Illustrated.....	18
Canadian News.....	19
Central Pennsylvania News.....	19
Editorials:	
Object Lessons in Currency.....	30
Commercial Aspect of Labor Unions.....	20
Work in Substituting More Permanent for Temporary Structures	21
Obituary.....	21
Pig Iron Production Heavily Diminished.....	23
Manufacturing:	
Iron and Steel.....	24
Machinery.....	24
Hardware.....	25
The Strike of the Machinery Molders.....	25
The Iron and Metal Trades:	
A Comparison of Prices.....	26
Chicago.....	26
Philadelphia.....	27
Cleveland.....	28
Cincinnati.....	29
Birmingham.....	29
Pittsburgh.....	30
New York.....	31
Metal Market.....	31
St. Louis.....	31
The British Iron Market.....	32
Personal.....	32
Iron and Industrial Stocks.....	33
The New Armored Cruisers.....	33
The New York Machinery Market.....	34
The Chicago and Northwest Machinery Market.....	35
Bids for Machine Tools for the Navy.....	36
Information Wanted.....	36
Hardware:	
Condition of Trade.....	37
Notes on Prices.....	37
Better Laws for Business Men and What is Being Done to	
Secure Them.....	39
Train of Kitchen Furnishings. Illustrated.....	40
Wanted—Form for Invoice Book.....	40
Trade Items.....	40
Indiana Retail Hardware Dealers' Association.....	41
The Retail Hardware, Implement and Vehicle Association of	
the Indian Territory.....	41d
Requests for Catalogues, &c.....	41d
Morse Twist Drill & Machine Company's New Catalogue.....	41d
Iron Pump Manufacturers' Association. Illustrated.....	42
Wheeling Corrugating Company's Catalogue.....	42
Price-Lists, Circulars, &c.....	42
Atlas Pipe Wrench.....	42
The Wilke Porcelain Refrigerators. Illustrated.....	43
Lee's Bread Crumber. Illustrated.....	43
Ogden Automatic Liquid Door Check. Illustrated.....	44
Dobler's Fasteners.....	44
Yankee Automatic Drills. Illustrated.....	45
Jones' Cable and Ratchet Saws. Illustrated.....	45
Wilcox Adjustable Hammock Holder. Illustrated.....	46
The Wayne Rotary Washers.....	46
Glass Shelf, Bar and Holders. Illustrated.....	46
Publishers' Department:	
The Iron Age Advertising Cuts. Illustrated.....	46
Illustrated Circulars of Advertising Cuts.....	46
Current Hardware Prices.....	47
Current Metal Prices.....	54



Yankee Automatic Drills.

North Bros. Mfg. Company, Philadelphia, Pa., have added to their line of automatic drills those shown in the accompanying cuts. The drills in Figs. 1 and 2 are designed for use by carpenters, cabinet makers, &c., for boring wood for various purposes, including setting screws, brads, nails, &c. Holes are bored in hard or soft woods, it is explained, without splitting. In operation, pushing the handle down revolves the drill, when a spring pushes the handle back to its place. During the return movement the drill point revolves backward to



Fig. 1.—Yankee Automatic Drill No. 41. Fig. 2.—Yankee Automatic Drill No. 42.

clear chips, &c. Drill No. 41, Fig. 1, is different in the operation of its magazine from the company's No. 40 Yankee drill. The magazine in the drill illustrated is opened by loosening the nut at its lower end, causing the interior of the handle to move up and expose all the drill points in plain view, as shown in the smaller illustration, enabling the operator to quickly select and remove the drill required. The chuck is referred to as being of new and improved design and as holding drill points tight and rigid. Drill No. 42, Fig. 2, is of the same construction as No. 41, but without any magazine for the drill points, and a wood handle in place of one of metal, hence lower in price. The drill points are put up in a small wooden box. The chuck is the same as used on Drill No. 41. Both drills are nickel plated and finished

in a workmanlike manner. Eight drill points, as illustrated in Fig. 3, are furnished with each tool, and are the same as used in the company's Nos. 40 and 41 drills.

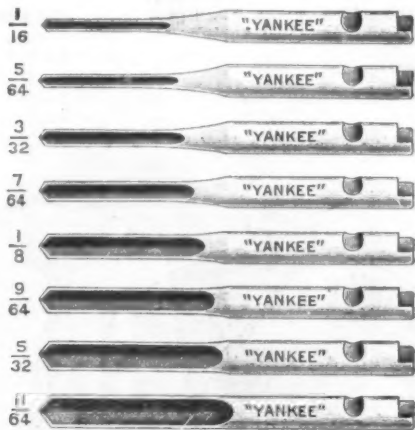


Fig. 3.—Yankee Drill Points.

The entire length of the drills, inclusive of a drill point, is 11 $\frac{3}{4}$  inches.

Jones' Cable and Ratchet Saws.

The accompanying cuts represent saws put on the market by Jones & Dommersnas, 81 and 33 Indiana

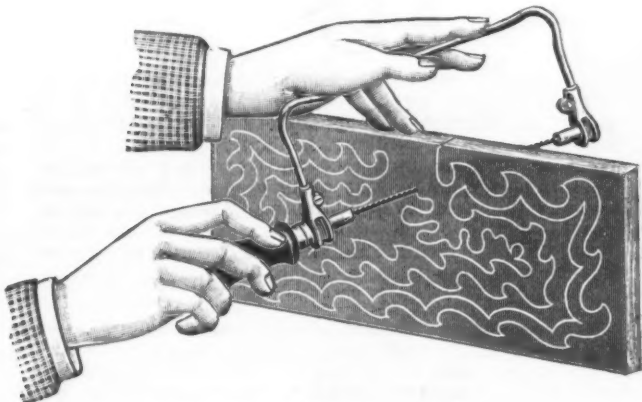


Fig. 1.—Jones' Cable Arrangement Saw.

street, Chicago, Ill. The saw with cable arrangement is shown in Fig. 1. The tubing is nickel plated, and is provided with a birch handle and cable arrangement to enable the operator to turn the saw blade at any angle. The cable consists of cable laid Italian hemp, which is referred to as strong and durable. Should it become

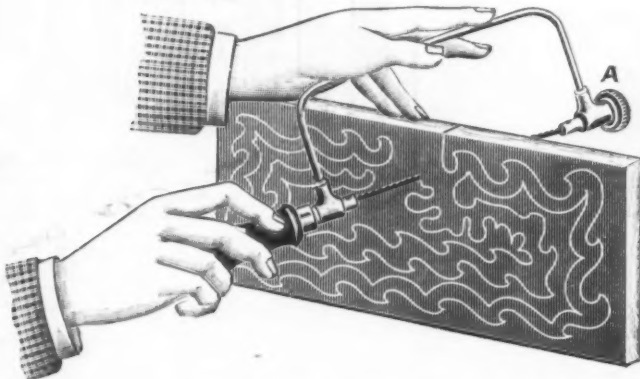


Fig. 2.—Jones' Ratchet Saw.

worn or broken it can be easily replaced, it is explained. The ratchet saw, Fig. 2, is constructed with a steel back and ratchet arrangement, to enable the workman to quickly set the blade at any angle by the use of the handle and the button A. Both kinds of saws are packed, one each in a pasteboard box, with six blades. The saws are designed for use by carpenters, pattern makers and all wood workers.

### Wilcox Adjustable Hammock Holder.

Wilcox Mfg. Company, Aurora, Ill., New York office 168 Church street, are manufacturing the Wilcox adjustable hammock holder, as here illustrated. This device permits the hammock being quickly hung and easily ad-

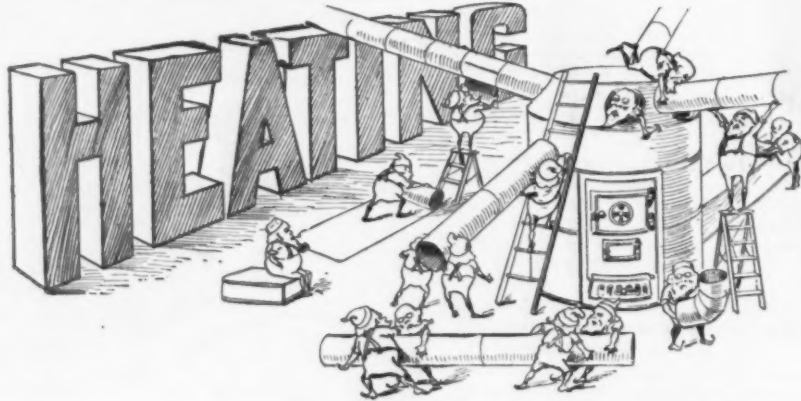


*Wilcox Adjustable Hammock Holder.*

justed at any required height from the ground, the holder swinging with the hammock. It is furnished in japanned or tinned finish. They are packed one dozen in a box, a dozen weighing 9 pounds.

### The Wayne Rotary Washers.

Referring to the illustrated description, in our issue of August 2, of the new rotary washers made by the Anthony Wayne Mfg. Company, Ft. Wayne, Ind., and St. Louis, Mo., the washers shown in Figs. 2 and 3 were incorrectly styled the "Western," whereas in both illustrations they should have been referred to as the "Wayne." The company emphasize the point that the hand wheel, which is the heaviest casting on the machine, is attached to the body of the washer, and that when the lid is lifted the wheel remains in its position,



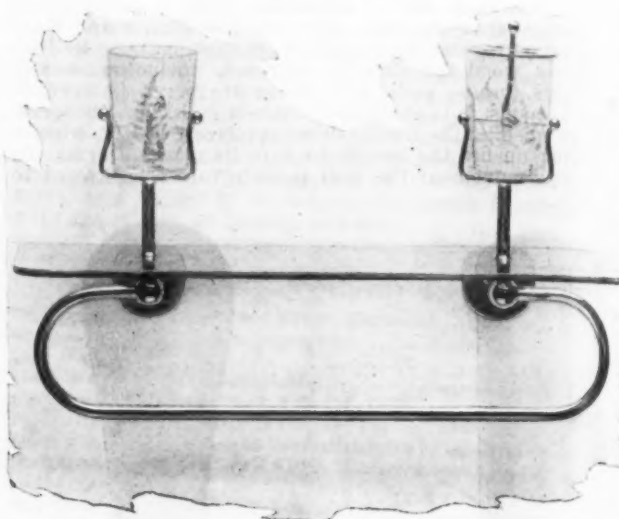
No. 75.—Price 75 Cents.

obviating the necessity of raising this additional weight; also that the danger of breakage is thus obviated should the lid be dropped suddenly or accidentally.

### Glass Shelf, Bar and Holders.

J. P. Eustis, 92 North street, Boston, New York office 116 Beekman street, is offering the glass shelf, bar and holders herewith illustrated. This is referred to as practically a complete bathroom outfit, with the exception of such articles as are usually used to hang in the tub.

The trimmings are brass, nickel plated. Spreaders for tooth brushes are provided at an additional cost when desired. The glass shelves are made in two sizes: 5 x 20



*Glass Shelf, Bar and Holders.*

inches and 5 x 24 inches. This article is illustrated in catalogue C, which shows a large line of bathroom goods.

## Publishers' Department.

### THE IRON AGE ADVERTISING CUTS.

The cut herewith, No. 75, has been added to our line of advertising cuts for the use of Hardware merchants. For the suggestion of the idea of this cut we are indebted to an enterprising merchant in Western New York, who considers it an effective means of attracting attention to the fact that the advertiser is prepared to do furnace work, &c. The price of the cut is 75 cents.

### ILLUSTRATED CIRCULARS OF ADVERTISING CUTS.

We have circulars describing the full line of Advertising Cuts which we are offering for the use of Hardware merchants. These cuts are of two general classes:

**Pictorial Cuts**, for the most part relating to special lines of goods.

**Outline Cuts**, representing separate Hardware articles in frequent sale. These cuts are made of small size so as to permit the use of several in an advertisement without occupying too much space.

Circulars, fully illustrated, with prices of cuts will be sent on application to

DAVID WILLIAMS COMPANY,

232-238 William Street, New York.



# Current Hardware Prices.

REVISED AUGUST 7, 1900.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Cut Prices.**—In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters Blind—

Domestic, # doz. \$3.00... 33 1/2 @ 33 1/2  
 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

## Window Stop—

Patent, # doz. \$3.00... 33 1/2 @ 33 1/2  
 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

## Ammunition—See Caps, Car-

tridges, Shells, &c.

## Anvils—American—

Patent, # doz. \$3.00... 33 1/2 @ 33 1/2  
 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

## Imported—

Patent, # doz. \$3.00... 33 1/2 @ 33 1/2  
 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

## Anvil, Vise and Drill—

Patent, # doz. \$3.00... 33 1/2 @ 33 1/2  
 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

## Apple Parers—See Parers,

Apple, &c.

## Aprons, Blacksmiths'—

Patent, # doz. \$3.00... 33 1/2 @ 33 1/2  
 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

## Augers and Bits—

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 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

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 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

## Augers and Bits—

Patent, # doz. \$3.00... 33 1/2 @ 33 1/2  
 Imported, # doz. \$3.00... 33 1/2 @ 33 1/2

Cheap, Handled Axes.....\$5.50 to \$7.75

Beveled, add 25c doz.

**Axe Grease—See Grease, Axe.**

**Axles—**

Concord, loose collar.....6 1/4 c

Concord, solid collar.....6 1/4 c

No. 1 Common.....5 c 1/4 c

No. 1 1/2 Com. New Style.....5 1/2 c 1/4 c

No. 2, Solid Collar.....5 1/4 c 1/4 c

Nos. 7, 8, 11 to 14.....50¢ to 10¢

Nos. 7, 8, 11 to 14, 100 sets.....60¢

Nos. 15 to 18.....50¢

Nos. 19 to 23.....60¢ to 10¢

**Boxes, A Xie—**

Common and Concord, not turned.....15. 5c

Common and Concord, turned.....15. 7c

Half Patent.....15. 9c

**Balances—**

**Sash—**

Caldwell new list.....50¢

Pullman's.....62 1/2¢

**Spring—**

Spring Balances.....50¢ to 5 1/2¢

Chatillon's Light Spz. Balances.....40¢ to 10¢

Chatillon's Slight Balances.....40¢

Chatillon's Circular Balances.....50¢

Chatillon's Large Dia.....40¢

Pelouze.....50¢

**Barb Wire—See Wire, Barb.**

**Bars—**

Steel Crowbars, 10 to 40 lb., per lb.....3 1/2¢ to 3 1/4¢

**Beams, Scale—**

Scale Beams, List Jan. 12, '93.....30 to 30¢

Chatillon's No. 1.....30¢

Chatillon's No. 2.....40¢

**Beats—**

**Egg—**

Standard Co.,

No. 5 Steel Handle Dover, # gro. \$6.50

No. 10 Cast Handle Dover, # gro. \$8.00

No. 10 St-el Handle Dover, # gro. \$8.00

No. 15 Extra Heavy Steel Handle, # gro. \$15.00

Rival, # gro. \$12.00

Taplin Mfg. Co.,

No. 50 Small Family size.....\$3.50

No. 100 R-gul r Family size.....\$3.00

No. 100 Regular Family size, tinned.....\$9.50

No. 150 Large Family size.....\$11.00

No. 150 Large Family size, tinned.....\$17.00

Lyon's Standard, # doz. \$1.75

Wonder (S. S. & Co.), # gro. \$7.50

**Bellows—**

Blacksmith, Standard List, 7¢ to 7 1/2¢

C. E. Jennings & Co., # doz. \$1.00 to 1 1/2¢

C. E. Jennings & Co., # doz. \$1.00 to 1 1/2¢

**Blacksmiths—**

Inch. 30 32 34 36 38 40

Each, \$3.70 3.95 4.25 4.50 4.75 5.00

Extra Length:

Each, \$4.25 4.50 4.75 5.00 5.25 5.50

**Molders—**

Inch. 9 10 11 12 14 16

Doz. \$6.75 7.25 8.50 9.50 12.00 14.50

**Hand—**

Inch. 6 7 8 9 10 12

Doz. \$3.75 4.25 4.50 5.00 5.75 6.75

**Bells—**

**Cow—**

Ordinary goods.....75¢ to 10¢

High grade.....70¢ to 10¢

Jersey.....75¢ to 10¢

Texas Star.....60¢ to 10¢

**Door—**

Barton G'ng.....55¢

Gong, Yankee.....55¢

House, R. & E. Mfg. Co., # doz. \$1.00

Lever and Pull, Sargent & # doz. \$1.00

**Hand—**

Hand Bells, Polished.....65¢ to 10¢

White Metal.....65¢ to 10¢

Nickel Plated.....50¢ to 10¢

Swiss.....60¢ to 10¢

**Miscellaneous—**

Farm Bells.....10¢ to 10¢

Steel Alloy Church and School.....50¢ to 10¢

Wilmet & Hobbs Mfg. Co., Gongs.....70¢

**Belting**

**Rubber—**

Common Standard.....70¢ to 10¢

Standard.....60¢ to 10¢

Extra.....60¢ to 10¢

High Grade.....60¢ to 10¢

**Leather—**

Extra Heavy, Short Lap.....50¢ to 10¢

Regular Short Lap.....60¢ to 10¢

Standard.....60¢ to 10¢

Light Standard.....70¢

**Cotton—**

Rosendale-Bedway B. & H. Co.,

Sphinx Brand.....80¢ to 10¢

Durable Brand.....70¢

**Bench Stops—See Stops, Bench**

**Benders and Upsetters,**

**Tire—**

Green River Tire Benders and Upsetters.....20¢

Ill. Iron & Bolt Co.....45¢

Stoddard's Lightning Tire Upsetters.....40¢ to 50¢

**Bicycle Goods—**

Lane's Cycle Hanger.....33 1/2¢ to 35¢

John S. Lang's Son's 1899 list:

Chain.....50¢

Parts.....50¢

Spokes.....50¢

Tub.....60¢

**Bits—**

Auger, Gimlet, Bit Stock Drills, &c.—

See Augers and Bits.

**Bit Holders—See Holders.**

**Blind Adjusters—See Ad-**

**justers, Blind.**

**Blind Fasteners—See Fast-**

**eners, Blind.**

**Blind Staples—See Staples,**

**Blind.**

**Blocks—**

**Tackle—**

Common Wooden.....70¢ to 10¢

Clove and Steel.....50¢ to 10¢

Eddy's Steel.....60¢ to 10¢

Hartz Steel.....50¢ to 10¢

Ford's Star Brand Self Lubricating.....60¢ to 10¢

Hollow Steel, Ford's Pat. Star Brand.....50¢ to 10¢

Lane's Patent Automatic Lock and

Junior.....50¢ to 10¢

Stowell's Novelty, Mal. Iron.....30¢

See also Machines, Hoisting.

**Beards, Stove—**

Zinc, Crystal, &c.....50¢ to 10¢

**Boils—**

**Carriage, Machine &c.—**

**Carpet Stretchers—**

See Stretchers, Carpet.

**Cartridges—**

B. B. Caps, Con., Ball Sngl.	\$1.90
B. B. Caps, Round Ball.	\$1.12 @ 1.18
<b>Blank Cartridges:</b>	
32 C. F., \$5.50	10¢5
38 C. F., \$7.00	10¢5
22 cal. Rim., \$1.50	10¢5
32 cal. Rim., \$2.75	10¢5
Central Fire	25¢
Pistol and Rifle	15¢5
Primed Shells and Bullets	15¢5
Rim Fire Sporting	50¢
Rim Fire, Military	15¢5

**Castors—**

Bed	60¢10¢10¢70¢
Plate	60¢10¢10¢10¢5
Philadelphia	70¢10¢10¢10¢10¢
Boss	70¢10¢
Boys	70¢10¢
Martin's Patent (Phoenix)	45¢
Payson's Anti-Friction Furniture	70¢10¢
Payson's Anti-Friction Truck	70¢10¢
Standard Ball Bearing	45¢
Tucker's Patent, low list	30¢

**Cattle Leaders—**

See Leaders, Cattle.

**Chain—**

American Coil, Full Casks:	
3-16	1/4 5-16 3/4 7-16 1/2 9-16 5/8 2-16
7-20	5/8 5.00 5.00 4.15 4.00 3.50 4.50
3/4	3/4 1 inch.
5/70	3.55 3.55 3.55 cents per lb.

Less than Cask lots add 10¢ per 100 lbs.

German Coil, list July 24, '97

60¢10¢10¢

German Haller Chain, list July 24, '97

60¢10¢10¢

Traces, Western Standard: 100 pair

6 1/2-6-3, Straight, with ring

6 1/2-6-2, Straight, with ring

6 1/2-8-2, Straight, with ring

6 1/2-10-2, Straight, with ring

Add 2¢ per pair for Hooks.

Twist Traces 2¢ per pair higher than

Straight Link.

Trace, Wagon and Fancy Chains,

list April, '95

60¢10¢10¢

Jack Chain, list July 10, '93

Iron

60¢10¢10¢

Brass

60¢10¢10¢

Safety Chain

60¢10¢10¢

Gal. Pump Chain

50¢10¢10¢

Breast, Hitching and Keln Chains

50¢

Covert Mfg. Co.:

Breast

35¢2

Halter

35¢2

Keel

35¢2

Keel

35¢2

Stallion

35¢2

Onesida Community

60¢10¢10¢

Eureka Coil and Halter

60¢10¢10¢

Niagara Coil and Halter

60¢10¢10¢

Niagara Cow Ties

45¢10¢10¢

Am. Coil and Halters

50¢10¢10¢

Am. Cow Ties

35¢10¢10¢

Wire Goods Co.:

Dog Chain

60¢

Universal Dbi-Jointed Chain

40¢

**Chalk—(From Jobbers.)**

Carpenters', Blue

gro. 15¢

Carpenters', Red

gro. 35¢

Carpenters', White

gro. 30¢

See also Crayons.

**Chalk Lines—See Lines.****Checks, Door—**

Bardsley's

40¢10¢

Columbia

50¢10¢

Eclipse

60¢10¢10¢

**Chests, Tool—**

C. E. Jennings &amp; Co.'s M. Cabinet's To 1

Chests

25¢25¢10¢

**Chisels—****Socket Framing and Firmer**

Standard List

70¢5¢5¢

Buck Bros.

30¢

Charles Buck

30¢

C. E. Jennings &amp; Co. 5000 Firmer

10

C. E. Jennings &amp; Co. 5000 Firmer

10

Swan

70¢5¢

L. &amp; L. J. White

30¢30¢25¢

**Tanged—**

Tanged Firmers

40¢5¢10¢10¢

Buck Bros.

30¢

Charles Buck

30¢

C. E. Jennings &amp; Co. 5000 Firmer

10

C. E. Jennings &amp; Co. 5000 Firmer

10

Swan

70¢5¢

L. &amp; L. J. White

30¢30¢25¢

**Cold—**

Cold Chisels, good quality lb.

14¢16¢

Cold Chisels, fair quality

lb. 12¢

Cold Chisels, ordinary

lb. 8¢9¢

**Chucks—**

Beach Pat., each \$5.00

20¢

Skinner Patent Chucks:

Combination Lathe Chucks

40¢

Drill Chucks, Patent

40¢

Drill Chucks, New 20 to 1

25¢

Independent Lathe Chucks

40¢

Improved Planer Chucks

20¢

Universal Lathe Chucks

40¢

Face Plate Jaws

35¢

Standard Tool Co.:

Improved Drill Chuck

45¢

Union Mfg. Co.:

Combination

40¢

Gear Drill

30¢

Geared Scroll

30¢

Independent

40¢

Union Drill

40¢

Universal

40¢

Face Plate Jaws

35¢

**Clamps—**

Adjustable, Hammers

20¢20¢5¢

Adjustable, Stearns

30¢

Cabinet, Sargent's

40¢10¢

Carriage Makers', P. S. &amp; W. Co.

40¢10¢

Carriage Makers', Sargent's

40¢10¢

Beav. Parallel

33¢10¢

Lineman's, Udea Drop Forge &amp; Tool

Co.

40¢

Saw Clamps, see Files, Saw Filers.

**Cleaners Walk—**

Star Socket, All Steel

30¢

Star Shank, All Steel

30¢

W. &amp; C. 3 in. All-steel

7 1/2 in. \$3.50

8 in. \$3.50

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Juice

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10¢10¢

10¢10¢

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**Complete—**  
Nail Metal, Assorted, gro. \$1.40@1.75  
Spike Metal, Assorted, gro. \$3.00@3.50  
Nail, Wood Handled, Assorted,  
gro. \$4.00@4.25  
Spike, Wood Handled, Assorted,  
gro. \$5.00@5.25

### Class, American Window

List Jan 1, 1898.

Small lots from store:

Single, Eastern. . . . .85%

First Bracket. . . . .85%

Second and Third Brackets. . . . .85%10%

Eastern, All Other Brackets. . . . .85%25%

Double, Eastern. . . . .85%

First Bracket. . . . .85%

Second, Third, Fourth and Fifth

Brackets. . . . .85%10%

All Other Brackets. . . . .85%20%

From Jobbers or Factory, with Freight

Allowance, except in Eastern district:

Carloads, Single Strength. . . . .85%25%

First Bracket. . . . .85%25%

Second and Third Brackets. . . . .85%

All Above. . . . .90%25%

Carloads, Double Strength

First Five Brackets. . . . .89%

60 inch Bracket. . . . .90%

70 to 100 inch Bracket, inclusive

. . . . .90%10%5%

All Above. . . . .90%25%

### Glue—Liquid, Fish

List A, Bottles or Cans, with Brush. . . . .75%50%

List B, Cans (½ pts., pts., qts.) . . . . .35%50%

List C, Cans (½ gal., gal.) . . . . .25%45%

### Glue Pots—See Pots, Glue.

### Grease, Axle—

Common Grade. . . . .gro. \$5.00@6.00

Dixon's Everlasting. . . . .10-lb pails, ea. 85¢

Dixon's Everlasting, in bxs. ½ doz. 1 lb

\$1.80; 2 lb \$2.00

know Flake

1 qt. cans, per doz. \$2.00; 2 qt. . . . .

\$3.20; 1 gal. cans, per doz. \$4.00; 2

3 gal. \$16.00; 5 gal. \$24.00.

### Grindstone Fixtures—

See Fixtures, Grindstone.

### Guards, Snow—

Cleveland Wire Spinning Co.:

Galv. Steel. . . . .\$10.00

Copper. . . . .\$18.00

### Cun Powder—See Powder.

### Hack Saws—See Saws.

### Hafts, Axi—

Peg Patent, Leather Top. . . . .\$1.50@2.55

Peg Patent, Plain Top. . . . .\$3.50@3.75

Sealing, Brass Ferrule. . . . .\$1.50@1.60

Saddlers, Brass Ferrule. . . . .\$1.25@1.45

Peg, Common. . . . .\$1.25@1.35

Brood, Common. . . . .\$1.50@1.75

### Halters and Ties—

Covert Mfg. Co., Web. . . . .45¢25¢

Covert Mfg. Co., Jute Rope. . . . .45¢25¢

Covert Mfg. Co., Sisal Rope. . . . .30¢25¢

Covert's Saddlery Works, 90 list, W-b. . . . .60¢10%

Covert's Saddlery Works, Leather. . . . .60¢10%

Covert's Saddlery Works, Jute. . . . .60¢10%

Covert's Saddlery Works, Sisal. . . . .60¢10%

Covert's Saddlery Works, Manila. . . . .60¢10%

Covert's Saddlery Works, Cotton. . . . .70¢10%

### Hammers—

#### Handled Hammers—

Holler's Machinists'. . . . .50¢50¢5%

Holler's Farmers'. . . . .50¢50¢5%

Magnetic Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

Peck, Stow & Wilcox. . . . .40¢40¢5%

Fayette R. Plumb. . . . .33%40%10%

Plumb, A. E. Nail. . . . .33%40%10%

Engineers' and B. S. Hand. . . . .50¢15¢24

Machinists' Hammers. . . . .50¢15¢24

Riveting and Tappers. . . . .33%40%10%

Sargent's C. S. New List. . . . .40¢10%

### Heavy Hammers and

#### Sledges—

1 lb. and under. . . . .lb. 45¢

1 to 5 lb. . . . .lb. 35¢ 75¢50¢75

Over 5 lb. . . . .lb. 30¢ 40%

Wilkinson's Smiths'. . . . .94¢10¢10

### Handcuffs and Leg Irons

See Police Goods.

### Handles—

#### Agricultural Tool Handles—

Box, Rake, Fork, etc. . . . .50¢10¢60%

Shovel, etc., Wood D Handle. . . . .50¢10¢60%

### Cross-Cut Saw Handles—

Atkins'. . . . .40¢5%

Champion. . . . .45¢45¢10%

Dixons'. . . . .30%

### Hangers—

Barn Door, New Pattern, Round

Groove, Regular:

Inch. . . . .3 4 5 6 8

Doz. . . . .\$1.10 1.45 1.80 2.10 2.75

Barn Door, New England Pattern,

Check Back, Round Groove, Regular:

Inch. . . . .3 4 5 6

Doz. . . . .\$1.50 2.00 2.00 2.55

Chicago Spring Butt Co.:

Friction. . . . .25%

Oscillating. . . . .25%

Big Twin. . . . .25%

Chisholm & Moore Mfg. Co.:

Baggage Car Door. . . . .50%

Elevator. . . . .40%

Railroad. . . . .35%

Coleman Hardware Mfg. Co.:

Czar Ball Bearing. . . . .\$7.50

No. 10 Roller Bearing. . . . .doz. pr. 5.50

No. 20 Roller Bearing. . . . .doz. pr. 4.50

No. 30 Roller Bearing. . . . .

**Bull's Eye Police—**  
 2 1/2-inch flash light..... doz. \$3.50 @ \$3.75  
 3-inch flash light..... doz. \$4.00 @ \$4.25  
 2 1/2-inch regular..... doz. \$3.25 @ \$3.50  
 3-inch regular..... doz. \$3.50 @ \$3.75

**Latches, Thumb—**  
 Roggin's Latches..... doz. \$2 @ \$3.50

**Lawn Mowers—**  
 See Mowers, Lawn.

**Leaders, Cattle—**  
 Small..... doz. 1.50; large, 55c  
 Covert mfg. Co..... 45 @ 55

**Lemon Squeezers—**  
 See Squeezers, Lemon.

**Lifters, Transom—**  
 Dickson:  
 3 x 4 ft. x 1/2..... \$100 \$11.00  
 Other sizes, iron..... 70 @ 105  
 Other size, Brass and Bronze..... 70 @ 105  
 Excelsior..... 80 @ 60 @ 105  
 Payson's:  
 Solid Grip Nos. 613 and 644, \$1.00  
 Bronzed Iron..... 70 @ 105

**Lines—**  
 Wire Clothes, Nos. 18 19 20  
 100 feet..... \$2.50 \$2.50 1.95  
 75 feet..... \$2.15 1.90 1.65  
 Osawan Mills:  
 Crown Solid Braided Chalk..... 33 @ 35  
 Mason's, No. 0 to No. 5..... 33 @ 35  
 Sams-n Cordage Works:  
 Solid Braided Chalk..... 40 @ 50  
 Silver Lake Braided Chalk, No. 0, \$4.00;  
 No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50  
 \$ gr. 30 @ 35 @ 105

**Locks, &c.— Cabinet—**  
 Cabinet Locks..... 35 @ 35 @ 7 1/2

**Door Locks, Latches, &c.—**  
 [Not prices are very often made on these goods.]

Reading Hardware Co..... 40 @ 50  
 R. & E. Mfg. Co..... 50 @ 50  
 Sargent & Co..... 40 @ 40 @ 105  
 Slawmaker-Barry Co..... 50 @ 105  
 Snow's Victor..... 50 @ 105

**Elevator—**  
 Stowell's..... 33 @ 35

**Padlocks—**  
 Wrought Iron, list Dec. 5, '97..... 70 @ 70 @ 105

Dog Collar, S. B. Co..... 50 @ 50  
 R. & E. Mfg. Co. Wrt Steel & Brass..... 50 @ 50  
 S. B. & Co..... 40 @ 50

**Sash, &c.—**  
 Fitch's Iron and Brass..... 60 @ 60  
 Fitch's Bronze..... 70 @ 70  
 Ives' Patent..... 62 1/2 @ 10 @ 60 @ 105  
 Oeffner's Aut-matic..... 50 @ 50  
 Payson's Perfect..... 70 @ 70  
 Payson's Signal (new list)..... 75 @ 75  
 Reading..... 60 @ 10 @ 105 @ 70

**Machines—**  
**Boring—**  
 Without Augers.  
 Upright. Angular.  
 Improved No. 3..... \$4.25 No. 1 \$5.00  
 Improved No. 4..... 3.75 No. 2 3.38  
 Improved No. 5..... 2.75  
 Jennings'..... 2.50 3.00  
 Miller's Falls..... 5.75  
 Snell's, Rice's Pat. 2.50 2.75  
 Swan's, No. 500..... 5.10 No. 200 6.45

**Hoisting—**  
 Moore's Anti-Friction Differential Pulley Block..... 30 @ 30  
 Moore's Hand Hoist, with Lock Brake..... 30 @ 30

**Ice Cutting—**  
 Chandler's..... 15 @ 15

**Washing—**  
 Wayne American..... \$ doz. \$28.00  
 Western Star, No. 2, \$ doz. 28.00  
 Western Star, No. 3, \$ doz. 30.00  
 St. Louis, No. 41, \$ doz. 60.00

**Mallets—**  
 Hickory..... 45 @ 50 @ 55  
 Lignumvitae..... 45 @ 50 @ 55  
 Tinnars', Hickory and Applewood, doz. 50 @ 55  
 Fiber Head Stearns'..... 30 @ 35

**Mats—**  
**Door—**  
 Elastic Steel (W. G. Co.)..... 10 @ 10

**Mattocks—**  
 See Picks and Mattocks.

**Meat Cutters—**  
 See Cutters, Meat.

**Milk Cans—**See Cans, Milk

**Mills—** Coffee  
 Box and Side, list Jan. 1, '83..... 50 @ 10 @ 5 @ 60 @ 5

Net prices are often made on some goods which are lower than above discounts.

Enterprise Mfg. Co..... 25 @ 30 @ 30  
 National, list Jan. 1, '04..... 30 @ 30  
 Parker's Columbia and Victoria..... 30 @ 30

Parker's Box and Side..... 50 @ 10 @ 6 @ 3  
 Swift, Lane Bros..... 50 @ 10 @ 60 @ 30

**Mining Knives—**  
 See Knives, Mining.

**Molasses Cans—**  
 See Gates, Molasses.

**Money Drawers—**  
 See Drawers, Money.

**Mowers, Lawn—**  
 Net prices are generally quoted.

Cheap..... all sizes, \$2.00  
 Good..... all sizes, \$2.50 @ 2.75

10 12 14 16-inch  
 High Grade..... 4.25 4.50 4.75 5.00  
 Pennsylvania and Continental 60 @ 10 @ 5  
 Quaker City..... 70 @ 5  
 Great American..... 70 @ 5

Philadelphia:  
 Styles M., S., C., K., T..... 70 @ 105  
 Style A, all Steel..... 60 @ 105  
 Style E, Low Wheel..... 60 @ 105  
 Style R, High Wheel..... 70 @ 105  
 Drexel and Gold Coin, low list..... 50 @

**Nails—**  
 Cut and Wire. See Trade Report.  
 Wire Nail and Brads, Papered.  
 List July 20, 1899..... 55 @ 5 @ 105  
 Hungarian, Finishing, Upholsterers', &c. See Tacks

**Horse—**  
 Nos. 6 7 8 9 10  
 A. C..... 25 @ 23 @ 22 @ 21 @ 20

Capewell..... 19 @ 18 @ 17 @ 16 @ 15 @ 14 @ 13 @ 12 @ 11 @ 10 @ 9 @ 8 @ 7 @ 6 @ 5 @ 4 @ 3 @ 2 @ 1 @ 0

Chapman..... 25 @ 23 @ 22 @ 21 @ 20 @ 19 @ 18 @ 17 @ 16 @ 15 @ 14 @ 13 @ 12 @ 11 @ 10 @ 9 @ 8 @ 7 @ 6 @ 5 @ 4 @ 3 @ 2 @ 1 @ 0

Maud's..... 25 @ 23 @ 22 @ 21 @ 20 @ 19 @ 18 @ 17 @ 16 @ 15 @ 14 @ 13 @ 12 @ 11 @ 10 @ 9 @ 8 @ 7 @ 6 @ 5 @ 4 @ 3 @ 2 @ 1 @ 0

Neonset..... 23 @ 21 @ 20 @ 19 @ 18 @ 17 @ 16 @ 15 @ 14 @ 13 @ 12 @ 11 @ 10 @ 9 @ 8 @ 7 @ 6 @ 5 @ 4 @ 3 @ 2 @ 1 @ 0

Putnam..... 23 @ 21 @ 20 @ 19 @ 18 @ 17 @ 16 @ 15 @ 14 @ 13 @ 12 @ 11 @ 10 @ 9 @ 8 @ 7 @ 6 @ 5 @ 4 @ 3 @ 2 @ 1 @ 0

Standard..... 23 @ 21 @ 20 @ 19 @ 18 @ 17 @ 16 @ 15 @ 14 @ 13 @ 12 @ 11 @ 10 @ 9 @ 8 @ 7 @ 6 @ 5 @ 4 @ 3 @ 2 @ 1 @ 0

Star..... 23 @ 21 @ 20 @ 19 @ 18 @ 17 @ 16 @ 15 @ 14 @ 13 @ 12 @ 11 @ 10 @ 9 @ 8 @ 7 @ 6 @ 5 @ 4 @ 3 @ 2 @ 1 @ 0

Vulcan..... 23 @ 21 @ 20 @ 19 @ 18 @ 17 @ 16 @ 15 @ 14 @ 13 @ 12 @ 11 @ 10 @ 9 @ 8 @ 7 @ 6 @ 5 @ 4 @ 3 @ 2 @ 1 @ 0

**Picture**  
 1 1/2 2 2 1/2 3 3 1/2 in.  
 Brass Head..... 45 @ 60 @ 70 @ 95 1.00 gro.  
 Por. Head..... 1.10 1.10 1.10 .. gro.

**Nippers, See Pliers and Nippers.**

**Nut Crackers—**  
 See Crackers, Nut.

**Nuts—**  
 List Feb. 1, '99.  
 Cold Punched Off  
 Mfrs. or U. S. Standard, list.

Hexagon, plain..... 4.40 @ 4.50  
 Square, plain..... 4.30 @ 4.40  
 Square, C. T. & R..... 4.10 @ 4.20  
 Hexagon, C. T. & R..... 4.70 @ 4.80

**Hot Pressed:**  
 Mfrs. U. S. or Nar. Gauge Stan'd.  
 Square..... 5.20 @ 5.30  
 Hexagon..... 5.50 @ 5.60

**NOTE.—Tapped Nuts are now 2-10c higher than above.**

**Oakum—**  
 Best or Government..... lb. 6 @ 4  
 Navy..... lb. 5 @ 4  
 U. S. Navy..... lb. 5 @ 4  
 Plumbers' Spun Navy..... 3 @ 4  
 In carload lots 1/4 lb. off f.o.b. New York.

**Oil, Axle—**  
 Snow Flake:  
 1 pt. cans, per doz..... \$3.00  
 1 qt. cans, per doz..... \$4.50  
 1 gal. cans, per doz..... \$15.00  
 5 gal. cans, per doz..... \$60.00

**Oil Tanks—**See Tanks, Oil.

**Oilers—**  
 Brass and Copper..... 40 @ 10 @ 50 @ 50  
 Tin or Steel..... 60 @ 10 @ 55 @ 55  
 Zinc..... 60 @ 10 @ 55 @ 55

Malleable, Hammers' Improved, No. 1, \$3.00; No. 2, \$4.00; No. 3, \$4.40 per doz. 20 @ 20  
 Malleable, Hammers' Old Pattern, same list..... 50 @ 105  
 Wilmet & Hobbs Mfg. Co..... 70 @ 70 @ 105

**Oponers—**  
**Can—**  
 French..... doz. 55 @ 55  
 Iron Handle..... doz. 55 @ 55  
 Sprague, Iron Handle, per doz. 55 @ 40 @ 50  
 Sardine Scissors, doz. \$1.75 @ \$2.00  
 Tip Top..... per doz. \$0.75  
 National, \$ gr. doz. \$1.75 @ \$2.00  
 Stowell's..... per doz. 40 @ 45 @ 50

**Egg—**  
 Nickel Plate..... per doz. \$2.00  
 Silver Plate..... per doz. \$4.00

**Packing—**  
**Rubber—**  
 Standard, fair quality..... 70 @ 10 @ 75 @ 75  
 Inferior quality..... 75 @ 10 @ 80 @ 80  
 Extra..... 80 @ 5 @ 10 @ 10 @ 5  
 Jenkins' Standard, \$ doz. 80 @ 25 @ 25 @ 5

**Miscellaneous—**  
 American Packing..... 90 @ 10 @ 10 lb.  
 Cotton Packing..... 13 @ 10 @ 10 lb.  
 Italian Packing..... 10 @ 10 @ 10 lb.  
 Jute..... 5 @ 10 @ 10 lb.  
 Russia Packing..... 12 @ 10 @ 10 lb.

**Pails—**  
**Creamery—**  
 S. B. & Co., with gauges.. No 1 \$6.50;  
 No. 2, \$6.75 per doz.

**Galvanized—**  
 Price per gro.  
 Inch..... 10 12 14 16  
 Water, Regular..... 18 00 21 00 24 00  
 Water, Heavy..... 22 00 25 00 28 00  
 Fire, Rd. Bottom..... 21 00 23 00 25 00  
 Well..... 27 00 29 00 31 00

**Pans—**  
**Dripping—**  
 Standard List..... 60 @ 60 @ 55

**Fry—**  
 Standard List..... 75 @ 10 @ 80 @ 80

**Roasting and Baking—**  
 Regal, S. S. & Co., \$ doz. No. 5, \$1.50;  
 No. 10, \$2.00; No. 20, \$2.50; No. 30, \$3.00;  
 Simplex, \$ gr. No. 40, \$3.00; No. 50, \$3.40; No. 60, \$3.80; No. 70, \$4.20; No. 80, \$4.60; No. 90, \$5.00; No. 100, \$5.40; No. 110, \$5.80; No. 120, \$6.20; No. 130, \$6.60; No. 140, \$7.00; No. 150, \$7.40; No. 160, \$7.80; No. 170, \$8.20; No. 180, \$8.60; No. 190, \$9.00; No. 200, \$9.40; No. 210, \$9.80; No. 220, \$10.20; No. 230, \$10.60; No. 240, \$11.00; No. 250, \$11.40; No. 260, \$11.80; No. 270, \$12.20; No. 280, \$12.60; No. 290, \$13.00; No. 300, \$13.40; No. 310, \$13.80; No. 320, \$14.20; No. 330, \$14.60; No. 340, \$15.00; No. 350, \$15.40; No. 360, \$15.80; No. 370, \$16.20; No. 380, \$16.60; No. 390, \$17.00; No. 400, \$17.40; No. 410, \$17.80; No. 420, \$18.20; No. 430, \$18.60; No. 440, \$19.00; No. 450, \$19.40; No. 460, \$19.80; No. 470, \$20.20; No. 480, \$20.60; No. 490, \$21.00; No. 500, \$21.40; No. 510, \$21.80; No. 520, \$22.20; No. 530, \$22.60; No. 540, \$23.00; No. 550, \$23.40; No. 560, \$23.80; No. 570, \$24.20; No. 580, \$24.60; No. 590, \$25.00; No. 600, \$25.40; No. 610, \$25.80; No. 620, \$26.20; No. 630, \$26.60; No. 640, \$27.00; No. 650, \$27.40; No. 660, \$27.80; No. 670, \$28.20; No. 680, \$28.60; No. 690, \$29.00; No. 700, \$29.40; No. 710, \$29.80; No. 720, \$30.20; No. 730, \$30.60; No. 740, \$31.00; No. 750, \$31.40; No. 760, \$31.80; No. 770, \$32.20; No. 780, \$32.60; No. 790, \$33.00; No. 800, \$33.40; No. 810, \$33.80; No. 820, \$34.20; No. 830, \$34.60; No. 840, \$35.00; No. 850, \$35.40; No. 860, \$35.80; No. 870, \$36.20; No. 880, \$36.60; No. 890, \$37.00; No. 900, \$37.40; No. 910, \$37.80; No. 920, \$38.20; No. 930, \$38.60; No. 940, \$39.00; No. 950, \$39.40; No. 960, \$39.80; No. 970, \$40.20; No. 980, \$40.60; No. 990, \$41.00; No. 1000, \$41.40; No. 1010, \$41.80; No. 1020, \$42.20; No. 1030, \$42.60; No. 1040, \$43.00; No. 1050, \$43.40; No. 1060, \$43.80; No. 1070, \$44.20; No. 1080, \$44.60; No. 1090, \$45.00; No. 1100, \$45.40; No. 1110, \$45.80; No. 1120, \$46.20; No. 1130, \$46.60; No. 1140, \$47.00; No. 1150, \$47.40; No. 1160, \$47.80; No. 1170, \$48.20; No. 1180, \$48.60; No. 1190, \$49.00; No. 1200, \$49.40; No. 1210, \$49.80; No. 1220, \$50.20; No. 1230, \$50.60; No. 1240, \$51.00; No. 1250, \$51.40; No. 1260, \$51.80; No. 1270, \$52.20; No. 1280, \$52.60; No. 1290, \$53.00; No. 1300, \$53.40; No. 1310, \$53.80; No. 1320, \$54.20; No. 1330, \$54.60; No. 1340, \$55.00; No. 1350, \$55.40; No. 1360, \$55.80; No. 1370, \$56.20; No. 1380, \$56.60; No. 1390, \$57.00; No. 1400, \$57.40; No. 1410, \$57.80; No. 1420, \$58.20; No. 1430, \$58.60; No. 1440, \$59.00; No. 1450, \$59.40; No. 1460, \$59.80; No. 1470, \$60.20; No. 1480, \$60.60; No. 1490, \$61.00; No. 1500, \$61.40; No. 1510, \$61.80; No. 1520, \$62.20; No. 1530, \$62.60; No. 1540, \$63.00; No. 1550, \$63.40; No. 1560, \$63.80; No. 1570, \$64.20; No. 1580, \$64.60; No. 1590, \$65.00; No. 1600, \$65.40; No. 1610, \$65.80; No. 1620, \$66.20; No. 1630, \$66.60; No. 1640, \$67.00; No. 1650, \$67.40; No. 1660, \$67.80; No. 1670, \$68.20; No. 1680, \$68.60; No. 1690, \$69.00; No. 1700, \$69.40; No. 1710, \$69.80; No. 1720, \$70.20; No. 1730, \$70.60; No. 1740, \$71.00; No. 1750, \$71.40; No. 1760, \$71.80; No. 1770, \$72.20; No. 1780, \$72.60; No. 1790, \$73.00; No. 1800, \$73.40; No. 1810, \$73.80; No. 1820, \$74.20; No. 1830, \$74.60; No. 1840, \$75.00; No. 1850, \$75.40; No. 1860, \$75.80; No. 1870, \$76.20; No. 1880, \$76.60; No. 1890, \$77.00; No. 1900, \$77.40; No. 1910, \$77.80; No. 1920, \$78.20; No. 1930, \$78.60; No. 1940, \$79.00; No. 1950, \$79.40; No. 1960, \$79.80; No. 1970, \$80.20; No. 1980, \$80.60; No. 1990, \$81.00; No. 2000, \$81.40; No. 2010, \$81.80; No. 2020, \$82.20; No. 2030, \$82.60; No. 2040, \$83.00; No. 2050, \$83.40; No. 2060, \$83.80; No. 2070, \$84.20; No. 2080, \$84.60; No. 2090, \$85.00; No. 2100, \$85.40; No. 2110, \$85.80; No. 2120, \$86.20; No. 2130, \$86.60; No. 2140, \$87.00; No. 2150, \$87.40; No. 2160, \$87.80; No. 2170, \$88.20; No. 2180, \$88.60; No. 2190, \$89.00; No. 2200, \$89.40; No. 2210, \$89.80; No. 2220, \$90.20; No. 2230, \$90.60; No. 2240, \$91.00; No. 2250, \$91.40; No. 2260, \$91.80; No. 2270, \$92.20; No. 2280, \$92.60; No. 2290, \$93.00; No. 2300, \$93.40; No. 2310, \$93.80; No. 2320, \$94.20; No. 2330, \$94.60; No. 2340, \$95.00; No. 2350, \$95.40; No. 2360, \$95.80; No. 2370, \$96.20; No. 2380, \$96.60; No. 2390, \$97.00; No. 2400, \$97.40; No. 2410, \$97.80; No. 2420, \$98.20; No. 2430, \$98.60; No. 2440, \$99.00; No. 2450, \$99.40; No. 2460, \$99.80; No. 2470, \$100.20; No. 2480, \$100.60; No. 2490, \$101.00; No. 2500, \$101.40; No. 2510, \$101.80; No. 2520, \$102.20; No. 2530, \$102.60; No. 2540, \$103.00; No. 2550, \$103.40; No. 2560, \$103.80; No. 2570, \$104.20; No. 2580, \$104.60; No. 2590, \$105.00; No. 2600, \$105.40; No. 2610, \$105.80; No. 2620, \$106.20; No. 2630, \$106.60; No. 2640, \$107.00; No. 2650, \$107.40; No. 2660, \$107.80; No. 2670, \$108.20; No. 2680, \$108.60; No. 2690, \$109.00; No. 2700, \$109.40; No. 2710, \$109.80; No. 2720, \$110.20; No. 2730, \$110.60; No. 2740, \$111.00; No. 2750, \$111.40; No. 2760, \$111.80; No. 2770, \$112.20; No. 2780, \$112.60; No. 2790, \$113.00; No. 2800, \$113.40; No. 2810, \$113.80; No. 2820, \$114.20; No. 2830, \$114.60; No. 2840, \$115.00; No. 2850, \$115.40; No. 2860, \$115.80; No. 2870, \$116.20; No. 2880, \$116.60; No. 2890, \$117.00; No. 2900, \$117.40; No. 2910, \$117.80; No. 2920, \$118.20; No. 2930, \$118.60; No. 2940, \$119.00; No. 2950, \$119.40; No. 2960, \$119.80; No. 2970, \$120.20; No. 2980, \$120.60; No. 2990, \$121.00; No. 3000, \$121.40; No. 3010, \$121.80; No. 3020, \$122.20; No. 3030, \$122.60; No. 3040, \$123.00; No. 3050, \$123.40; No. 3060, \$123.80; No. 3070, \$124.20; No. 3080, \$124.60; No. 3090, \$125.00; No. 3100, \$125.40; No. 3110, \$125.80; No. 3120, \$126.20; No. 3130, \$126.60; No. 3140, \$127.00; No. 3150, \$127.40; No. 3160, \$127.80; No. 3170, \$128.20; No. 3180, \$128.60; No. 3190, \$129.00; No. 3200, \$129.40; No. 3210, \$129.80; No. 3220, \$130.20; No. 3230, \$130.60; No. 3240, \$131.00; No. 3250, \$131.40; No. 3260, \$131.80; No. 3270, \$132.20; No. 3280, \$132.60; No. 3290, \$133.00; No. 3300, \$133.40; No. 3310, \$133.80; No. 3320, \$134.20; No. 3330, \$134.60; No. 3340, \$135.00; No. 3350, \$135.40; No. 3360, \$135.80; No. 3370, \$136.20; No. 3380, \$136.60; No. 3390, \$137.00; No. 3400, \$137.40; No. 3410, \$137.80; No. 3420, \$138.20; No. 3430, \$138.60; No. 3440, \$139.00; No. 3450, \$139.40; No. 3460, \$139.80; No. 3470, \$140.20; No. 3480, \$140.60; No. 3490, \$141.00; No. 3500, \$141.40; No. 3510, \$141.80; No. 3520, \$142.20; No. 3530, \$142.60; No. 3540, \$143.00; No. 3550, \$143.40; No. 3560, \$143.80; No. 3570, \$144.20; No. 3580, \$144.60; No. 3590, \$145.00; No. 3600, \$145.40; No. 3610, \$145.80; No. 3620, \$146.20; No. 3630, \$146.60; No. 3640, \$147.00; No. 3650, \$147.40; No. 3660, \$147.80; No. 3670, \$148.20; No. 3680, \$148.60; No. 3690, \$149.00; No. 3700, \$149.40; No. 3710, \$149.80; No. 3720, \$150.20; No. 3730, \$150.60; No. 3740, \$151.00; No. 3750, \$151.40; No. 3760, \$151.80; No. 3770, \$



Note.—The above are the regular Association prices to small retailers, but are often shaded by jobbers 20.50@1.00

**Shovels and Tongs—**

Grass Head ..... 60¢@60¢10¢  
Iron Head ..... 60¢@60¢10¢

**Sieves and Sifters—**

Hunter's Imitation, gro. \$11.00@12.00  
Buffalo Metallic Blue, S. S. & Co., 16x18 18x20  
12x90 \$13.80 \$15.00  
Eclipse ..... gr. \$10.00  
Electric Light ..... gr. \$12.00  
Hunter's Genuine ..... gr. \$12.50  
Shaker (Barber's Pat.) Flour Sifters  
1/2 doz. \$2.00 ..... 90¢

**Sieves, Wooden Rim—**

Nested, 10, 11 and 12 Inch.  
Mesh 18, Nested, doz. .... \$0.75@0.80  
Mesh 20, Nested, doz. .... .85@.90  
Mesh 24, Nested, doz. .... 1.00@1.05

**Sinks—**

Cast Iron—  
Standard list ..... 60¢@60¢10¢  
NOTE.—There is not entire uniformity  
in lists used by jobbers.

**Wrought Steel—**

Columbus Galv'd and Enameled, 60x25  
Columbus, Painted ..... 45¢  
L. & G. Mfg. Co., Galvanized ..... 50¢  
L. & G. Mfg. Co., Enameled ..... 50¢

**Skins, Wagon—**

Cast Iron ..... 70¢@70¢10¢  
Malleable Iron ..... 40¢@40¢50¢  
Steel ..... 35¢@35¢55¢  
L. I. & B. Co. Steel ..... 35¢

**Slates—**

"D" Slates ..... 60¢@10¢50¢10¢10¢  
Unexcelled Noiseless Slates .....  
60¢@10¢50¢10¢50¢  
Wire Bound ..... 40¢@40¢50¢  
Double Slates, ad \$1 case, net.

**Slaw Cutters—See Cutters.****Slicers, Vegetable—**

Sterling \$2.00 ..... 33¢

**Snaps, Harness—**

German ..... 40¢@40¢10¢  
Covert Mfg. Co. .... 35¢@45¢  
High Grade ..... 45¢@45¢  
Jockey ..... 4¢@4¢25¢  
Trojan ..... 45¢@45¢

Covert's Saddlery Works: .....  
Banner ..... 60¢@10¢  
Crown ..... 60¢@10¢  
Triumph ..... 60¢@10¢

W. & E. T. Fitch Co.: .....  
Bristol ..... 40¢@10¢  
Empire ..... 50¢@50¢  
German ..... 40¢  
National ..... 50¢@50¢  
Perfect ..... 45¢  
Clipper ..... 50¢@50¢  
Champion ..... 40¢  
Security ..... 40¢  
Victor ..... 50¢@50¢

One in Community: .....  
Solid Steel ..... 65¢@65¢10¢  
Satin Swivel ..... 5¢@45¢10¢  
Sargent's Patent Guard ..... 60¢@10¢

**Snaths—**

Scythe ..... 45¢@50¢

**Snips, Tinnners'—See Shears.****Soldering Irons—**

See Irons, Soldering.

**Spoke Trimmers—**

See Trimmers, Spoke.

**Spoons and Forks—**

Silver Plated—

Flat Ware ..... 50¢@10¢60¢10¢  
Wm. Rogers Mfg. Co. .... 50¢@10¢

**Miscellaneous—**

German Silver ..... 60¢@10¢  
Wm. Rogers Mfg. Co.: .....  
18° German Silver ..... 60¢  
Rogers' Silver Metal ..... 50¢@10¢

**Springs—**

Door—

Gem (Coll) ..... 20¢  
Star (Coll) ..... 30¢  
Torrey's Rod, 39 in., 1/2 doz. \$1.10@1.25  
Warner's No. 2, 1/2 doz. \$2.50; No. 3,  
\$3.00 ..... 60¢@10¢  
Victor (Coll) ..... 50¢@10¢10¢

**Carriage, Wagon, &c.**

Factory Shipments.

1 1/4 in. and wider, Blk. Hf. Brt. Brt.  
1 1/4 1 1/2 1 3/4 1 1/2 lb  
Cliff's Bolster Springs ..... 35¢  
Cliff's Seat Springs ..... pair 55¢

**Sprinklers, Lawn—**

Enterprise ..... 25¢@30¢  
Philadelphia No. 1, 1/2 doz. \$12; No. 2,  
\$15; No. 3, \$24 ..... 30¢

**Squares—**

Nickel plated, List Jan. 5, 1900

Steel and Iron, ..... 70¢@70¢  
Rosewood Hdl. Try Square and T-  
Bevels ..... 60¢@10¢10¢  
Iron Hdl. Try Squares and T-Bevels,  
10¢@10¢10¢10¢

Diamond's Try Sq. and T-Bevels ..... 60¢@10¢  
Winterbottom's Try and Miter ..... 50¢@10¢

**Squeezers—**

Lemon—

Wood, Common, gro., No. 0, \$5.25  
@5.50; No. 1, \$6.25@6.50.  
Wood, Porcelain Lined:  
Cheap ..... doz. \$1.00@2.75  
Good Grade ..... doz. \$3.00@5.50

Tinned Iron ..... doz. \$0.75@1.25  
Iron, Porcelain Lined doz. \$2.90@3.25  
Jennings' Star ..... 1/2 doz. \$1.85@1.90  
Klug ..... 1/2 doz. \$2.00

**Staples—**

Barbed Blind ..... lb. 8¢@9¢  
Electricians', Association list, 7¢@10¢  
Fence Staples, same price as Barbed  
Wire. See Trade Report.  
Poultry Netting Staples, per lb. 5¢.  
Grand Crossing Tack Co.'s list ..... 80¢@10¢

**Steels, Butchers'—**

Dick's ..... 40¢  
Foster Bros' ..... 30¢  
C. & A. Hoffmann's ..... 50¢  
Nichols Bros ..... 50¢

**Steelyards—**

Blacksmiths' ..... 60¢@40¢10¢  
Gardner & Sons No. 1 ..... 50¢  
Gardner Die Stocks, larger sizes ..... 40¢  
G. & R. River ..... 25¢  
Lightning Screw Plate ..... 35¢  
Little Giant ..... 25¢  
Reece's New Screw Plates ..... 35¢  
Curtis Reversible Ratchet Die Stock ..... 35¢

**Stocks and Dies—**

Pike Mfg. Co., list '95-'96 ..... 33¢  
Cleveland Stone Co., list Nov. '92 ..... 33¢

**Stone—**

Scythe Stones—

Pike Mfg. Co.: .....  
Hindustan No. 1, 1/2 doz. 8¢  
Sand Stone ..... 83¢  
Turkey Oil Stone, Extra, ..... 83¢@10¢  
5 to 3 in. ..... \$1.50

Lily White Washita ..... 60¢  
Rosy Red Washita ..... 60¢  
Washita Stone, Extra ..... 50¢  
Washita Stone, No. 1 ..... 40¢  
Washita Stone, No. 2 ..... 30¢  
Lily White Slips ..... 90¢  
Rosy Red Slips ..... 90¢  
Washita Slips, Extra ..... 80¢  
Washita Slips, No. 1 ..... 70¢  
Arkansas Stone, No. 1, 3 to 5 in. 8¢  
Arkansas Stone, No. 1, 5 to 8 in. \$1.50

**Oil Stones, &c.**

India Oil Stoves ..... 25¢

**Stones—**

Cherry—

Enterprise ..... 25¢@30¢

**Stops, Bench—**

Millers Falls ..... 15¢@10¢  
Morrill's, 1/2 doz., No. 1, \$10.00; No. 2,  
\$11.00, 40¢@20¢

**Stops, Window—**

Ives' Patent ..... 25¢@55¢  
Taplin's ..... 45¢  
Wilcox, Steel, per doz., \$0.00 ..... 50¢

**Stove Boards—**

See Boards, Stove.

**Stove Polish—See Polish, Stove.****Straps, Box—**

Cary's Universal case lots ..... 20¢@10¢

**Stretchers, Carpet—**

Cast Iron, Steel Points ..... doz. 55¢@65¢  
Cast Steel, Polished ..... doz. \$2.25  
Socket ..... doz. \$1.75

**Stuffers, Sausage—**

Miles' Challenge, 1/2 doz. \$30 ..... 50¢@50¢55¢  
Enterprise Mfg. Co. .... 25¢@25¢75¢  
National Specialty Mfg. Co., list Jan.  
1, '97 ..... 80¢

**Tacks Brads, &c.—**

See Trade Report.

List Jan. 15, '99.

Carpet Tacks, American ..... 90¢@10¢  
American Cut Tacks ..... 90¢@10¢  
Swedes Iron Tacks ..... 90¢@10¢  
Swedes Upholsterers' Tacks ..... 90¢@10¢  
Gimp Tacks ..... 90¢@10¢  
Lace Tacks ..... 90¢@10¢  
Trimmers' Tacks ..... 90¢@10¢  
Looking Glass Tacks ..... 70¢@10¢  
Bill Posters' and Railroad Tack ..... 90¢@10¢  
Hungarian Nails ..... 80¢@25¢  
Common and Patent Brads, 70¢@10¢  
Trunk and Clout Nails ..... 80¢@10¢

NOTE.—The above prices are for  
Straight Weights. An extra 5% is given  
Star Weights and an extra 10% on  
Standard Weights.

**Miscellaneous—**

Double Point Tacks, 90¢@7 or 8 tens

Steel Wire Brads, R. & E. Mfg.  
Co.'s list ..... 50¢@10¢@90¢

**Tanks, Oil—**

Emerald, S. S. & Co. .... 30-gal. \$3.30  
Emerald, S. S. & Co. .... 50-gal. \$4.00  
Queen City S. S. & Co., 60-gal. \$4.50  
Queen City S. S. & Co., 60-gal. \$4.35

**Tapes, Measuring—**

American Ases' Skin ..... 40¢@10¢50¢  
Patent Leather ..... 50¢@30¢55¢  
Steel ..... 10¢@10¢55¢  
Chesterman's ..... 25¢@25¢55¢

Eddy's Steel ..... 40¢@40¢55¢  
Eddy's Metallic ..... 33¢@33¢55¢  
Keuffel & Esser Co., Steel and Metallic,  
Lower list, 1899 ..... 35¢  
Lufkin's Steel ..... 33¢@35¢  
Lufkin's Metallic ..... 30¢@30¢55¢

**Thermometers—**

Tin Case ..... 80¢@80¢10¢

**Ties, Bale—Steel.**

Standard Wire ..... 50¢@10¢55¢

**Ties, Wall—**

Cleveland Wire Sp'ing Co.:  
Galv. Steel 5 3/2 x 8 1/2 in. \$1000 \$10.00  
Galv. Steel 5 3/2 x 8 1/2 in. \$1000 \$11.00  
Galv. Steel 5 3/2 x 11 1/2 in. \$1000 \$12.00  
Galv. Steel 5 3/2 x 15 1/2 in. \$1000 \$14.00

**Tinners' Shears, &c.—**

See Shears, Tinnners', &c.

**Tinware—**

Stamped, Japanned and Pieced, sold  
very generally at net prices.

**Tire Benders, Upsetters,**

&c.—See Benders and Upset-  
ters, Tire

**Tobacco Cutters—**

See Cutters, Tobacco.

**Tools—**

Coopers'—

L. & I. J. White ..... 20¢@20¢55¢

**Saw—**

Atkins' new list ..... 40¢  
Simonds' Improved ..... 35¢@55¢  
Simonds' Crescent ..... 25¢

**Ship—**

L. & I. J. White ..... 25¢

**Transom Lifters—**

See Lifters, Transom.

**Traps—Game—**

Oneida Pattern ..... 70¢@10¢75¢10¢  
Newhouse ..... 45¢@50¢  
Hawley & Norton ..... 65¢@70¢  
Victor (Oneida Pattern) ..... 75¢@75¢10¢  
Star (Blake Pattern) ..... 65¢@10¢70¢55¢

**Mouse and Rat—**

Mouse, Wood, Choker, doz. holes 90¢@95¢  
Mouse, Round or Square Wire .....  
doz. \$0.85@1.00

Marty French Rat and Mouse Traps  
(Genuine):  
No. 1, Rat, 1/2 doz. \$12.00; case of 24  
\$10.50  
No. 3, Rat, 1/2 doz. \$5.50; case of 50  
\$5.00  
No. 3 1/2, Rat, 1/2 doz. \$1.50; case of 72  
\$1.00  
No. 4, Mouse, 1/2 doz. \$3.50; case of 72  
\$2.75  
No. 5, Mouse, 1/2 doz. \$2.75; case of 150  
\$2.25  
Schuyler's Rat Killer, No. 1, 1/2 gr. \$30.00;  
No. 2, 1/2 gr. \$30.00; Mouse, No. 3,  
\$18.00 ..... 50¢

**Flv—**

Balloon, Globe or Acme .....  
doz. \$1.15@1.25; gro. \$12.00@14.00  
Harper, Champion or Paragon  
doz. \$1.25@1.40; gro. \$13.50@15.00

**Trimmers, Spoke—**

Bonney's Nos. 1 and 2 ..... 40¢  
Stearns ..... 25¢

**Trowels—**

Diamond Brick and Pointing ..... 30¢  
Diamon Plastering ..... 25¢  
Diamon "Standard Brand" and Gar-  
den Trowels ..... 40¢  
Never-Break steel Garden Trowels .....  
gro. \$7.00

Peace's Plastering ..... 90¢  
Rose Brick and Plastering ..... 25¢@55¢  
Woodrough & McParlin, Plastering ..... 25¢@10¢

**Trucks, Warehouse, &c.—**

B. & L. Block Co.'s list ..... 40¢  
Daily Stove Trucks, improved pattern  
1/2 doz. \$21.00  
Model Stove Trucks ..... 1/2 doz. \$18.50

**Tubs, Wash—**

No. 1 2 3  
Galvanized, per doz. \$5.00 5.50 6.00  
Galvanized Wash tubs (S. S. & Co.):  
No. 1 2 3 10 20 30  
Per doz. \$3.25 6.00 6.75 6.50 7.25 8.00

**Twine—**

Miscellaneous—

Flax Twine ..... BC B.  
No. 9, 3/4 and 1/2-lb. Balls ..... 22¢ 26¢  
No. 12, 3/4 and 1/2-lb. Balls ..... 19¢ 22¢  
No. 18, 3/4 and 1/2-lb. Balls ..... 16¢ 19¢  
No. 24, 3/4 and 1/2-lb. Balls ..... 13¢ 16¢  
No. 36, 3/4 and 1/2-lb. Balls ..... 10¢ 13¢  
Chalk Line, Cotton, 1/2-lb. Balls .....  
18¢@20¢  
Cotton Mops, 6, 9, 12 and 15 lb. 10  
doz. 7¢@8¢  
Cotton Wrapping, 5 Balls to lb. .....  
9¢@10¢  
American 2-Ply Hemp, 1/4 and 1/2-lb.  
Balls ..... 12¢@13¢  
American 3-Ply Hemp, 1-lb. Balls .....  
12¢@13¢  
India 2-Ply Hemp, 1/4 and 1/2-lb.  
Balls (Spring Twine) ..... 10¢  
India 3-Ply Hemp, 1-lb. Balls ..... 10¢

India 3-Ply Hemp, 1 1/4-lb. Balls .....  
2, 3, 4 and 5-Ply Jute, 1/2-lb. Balls .....  
No. 255 Mattress, 1/4 and 1/2-lb. Balls .....  
Wool ..... 80¢

**Vises—**

Solid Box ..... 40¢@10¢  
Bonney's Saw Vises ..... 40¢@10¢

**Parallel—**

Athol Machine Co.:  
Simpson's Adjustable ..... 40¢  
Standard ..... 40¢  
Amateur ..... 25¢  
Bonney's ..... 40¢@10¢  
Fisher & Norris Double Screw ..... 15¢@10¢  
Hollands:  
Machinists' ..... 40¢  
Kerston ..... 70¢  
Lewis Tool Co. .... 20¢@10¢  
Massey's Perfect ..... 15¢@20¢  
Massey's Clincher ..... 30¢@40¢  
Merrill's ..... 20¢  
Miller's Falls ..... low list 10¢  
Parker's:  
Victor ..... 20¢@25¢  
Regulars ..... 20¢@25¢  
Vulcan's ..... 40¢@45¢  
Combination Pipe ..... 55¢@40¢  
Prentiss ..... 20¢@25¢  
Sargent's ..... 40¢  
Simpson's Adjustable ..... 40¢  
Snediker's X. L. ..... 20¢@25¢  
Stephens ..... 20¢@25¢  
Toles' Woodworking ..... 25¢  
Van, W. & W. Hdw. Co. .... 40¢

**Saw Filers—**

Bonney's No. 1, \$13; No. 3, \$16 ..... 50¢@10¢  
Dixton's D 3 Clamp and Guide, 1/2 doz.  
\$30 ..... 25¢  
Reading ..... 40¢@10¢  
Wentworth's Rubber Jaw, Nos. 1, 2  
and 3 ..... 30¢@75¢

**Miscellaneous—**

Signal & Keeler Combination Pipe  
Vise ..... 60¢

Parker's Combination Pipe:  
#7 Series ..... 60¢  
187 Series ..... 60¢@55¢  
No. 870 ..... 40¢

**Wads—Price Per M.**

B. E., 11 up ..... 60¢  
B. E., 9 and 10 ..... 70¢  
B. E., 8 ..... 80¢  
B. E., 7 ..... 80¢  
P. E., 11 up ..... \$1.00  
P. E., 9 and 10 ..... 1.25  
P. E., 8 ..... 1.50  
P. E., 7 ..... 1.50  
Ely's B. E., 11 and larger ..... \$1.70@1.75  
Ely's P. E., 12 to 20 ..... \$3.00@3.25

**Wagon Jacks—**

See Jacks, Wagon.

**Ware, Hollow—**

Aluminum—  
S. S. & Co. Reduced List ..... 40¢

**Cast Iron, Hollow—**

Stove Hollow Ware:  
Ground ..... 60¢@60¢10¢  
Unground ..... 65¢@65¢10¢  
White Enameled Ware:  
Molain Kettles ..... 75¢@10¢75¢10¢  
Boilers and Saucepans ..... 55¢@55¢  
Tinned Boilers and Saucepans .....  
55¢@55¢

See also Pots, Glue.

**Enameled—**

Agate Nick 1 Steel Ware, list July '99, 35¢

Granite Ware, list Jan. 1, '94, revised  
Jan. 2, '95 ..... 40¢@10¢  
Second quality, Agate Nickel Steel ..... 60¢  
Second quality, enamel ..... 70¢@10¢70¢10¢10¢

Iron Clad:  
Repaired Ware, high list ..... 70¢  
Mottie's Ware, high list ..... 75¢  
Never Break Enameled ..... 50¢@50¢10¢

**Tea Kettles—**

Galvanized Tea Kettles:  
Inch. .... 6 7 8 9  
Each ..... 50¢ 55¢ 60¢ 70¢

**Steel Hollow Ware.**

Avery Spiders & Griddles ..... 65¢@35¢  
Avery Kettles ..... 60¢  
Porcelain ..... 60¢@50¢10¢  
Never Break Spiders and Griddles .....  
65¢@55¢

Never Break Kettles ..... 60¢@60¢10¢  
Solid Steel Spiders & Griddles ..... 60¢  
Solid Steel Kettles ..... 60¢  
Solid Steel Ware, Enameled ..... 50¢@50¢

**Silver Plated Hollow—**

William Rogers Mfg. Co. .... 40¢@10¢

**Washboards—**

Solid Zinc: .....  
Crescent, family size, bent frame, \$1.00  
Red star, laundry size, stationary  
protector ..... \$1.25  
Double Zinc Surface:  
Saginaw Globe, family size, station-  
ary protector ..... 60¢  
Wilson, family size, bent frame ..... 75¢  
Single Zinc Surface:  
Nalad protector, family size, 60¢  
back perforated ..... 40¢  
Saginaw Globe, protector, family  
size, ventilated back ..... 25¢  
Wilson, bent frame family size  
ventilated back ..... 40¢



**Washers—**  
**Leather, Axle—**  
Solid 1.....80¢ 10¢ 10¢ 85¢  
Paint.....85¢ 85¢ 85¢  
Cord 1/2 1 1 1/2 1 1/4 1/2  
11c 12c 13c 15c per 100  
**Iron or Steel—**  
Size bolt... 5-16 3/4 1/2 5/8 3/4  
Washers.....\$5.60 4.70 3.50 3.20 3.00  
In lots less than one keg add 1/4c per  
lb. 5-lb. boxes add 1/2c to list.  
**Cast Washers**  
Over 1/2 inch, barrel lots.....per lb., 2c  
**Washer Cutters—**  
See Cutters, Washer.  
**Washing Machines—**  
See Machines, Washing.  
**Water Coolers—**  
See Coolers, Water.  
**Weaners—**  
Tyler's New Ha Ter—No. 1, 2 doz. \$3.45;  
No. 2, \$3.70; No. 3, \$4.00; No. 4, \$4.30  
Tyler's Safety—Nos. 1 and 2, 2 doz. \$1.70;  
No. 3, \$2.00; No. 4, \$2.30.  
**Wedges—**  
Oil Finish.....lb. 3 1/2c  
Aze Finish.....lb. 4c

**Weights, Sash—**  
Eastern prices.....\$25.00  
Western prices.....\$30.00  
NOTE.—There is a wide difference in  
prices East and West, and some found-  
ries are naming lower prices than the  
above  
**Well Buckets, Galvanized**  
See Pails, Galvanized.  
**Wheels Well—**  
8-in., \$1.75 @ 1.85; 10-in., \$2.25 @ 2.35;  
12-in., \$2.75 @ 2.85; 14-in., \$3.25 @ 3.40  
**Wire and Wire Goods—**  
Brt. and Ann., 6 to 9.....70¢ 10¢  
Brt. and Ann., 10 to 18.....72 1/2¢ 10¢  
Brt. and Ann., 19 to 26.....75¢ 10¢  
Brt. and Ann., 27 to 36.....75¢ 10¢  
Cord and Galv., 6 to 9.....70¢ 10¢  
Cord and Galv., 10 to 18.....70¢ 10¢  
Cord and Galv., 19 to 26.....70¢ 10¢  
Cord and Galv., 27 to 36.....72 1/2¢ 10¢  
Tinned, 6 to 14.....70¢ 10¢  
Tinned, 15 to 18.....70¢ 10¢  
Tinned, 19 to 26.....70¢ 10¢  
Tinned, 27 to 36.....65¢ 10¢  
Annealed Wire on Spools.....60¢ 10¢ @ 10¢ 70¢  
Brass and Copper Wire on Spools.....50¢ 10¢ @ 60¢  
Brass, list Feb. 26, '96.....20¢

Copper, list Feb. 26, '96.....15¢  
Cast Steel Wire.....60¢  
Stub's Steel Wire.....\$6.00 to \$2, 40¢  
Wire Clothes Line, see Lines.  
Wire Picture Cord, see Cord.  
**Bright Wire Goods—**  
Iron and Brass, list July 1, 1899.....  
85¢ 10¢ @ 85¢ 10¢ 5¢  
**Wire Cloth and Netting—**  
Galvanized Wire Netting 30¢ 10¢ 5¢ 2¢  
Painted Screen Cloth per 100 ft.....  
\$1.30 @ 1.40  
**Hardware Grade, Iron:**  
2 to 20 mesh.....sq. ft. 2 1/2¢ 3c  
20 to 25 mesh.....sq. ft. 3¢ 3 1/2c  
Galv. Hardware Grade, 2 to 5 mesh.....  
sq. ft. 3 1/2¢ 3 1/2c  
Galv. Hardware Grade, 6 to 8 mesh.....  
sq. ft. 4¢ 4 1/2c  
**Wire Barb—See Trade Repor**  
**Wire, Ro e—See Rops, Wire.**  
**Wrenches—**  
Agricultural.....70¢ 10¢ @ 70¢ 10¢ 5¢  
Baxter's S.....60¢ 10¢  
Coes' Genuine.....40¢ 10¢ 5¢ 5¢  
Coes' Mechanics.....40¢ 10¢ 5¢ 5¢  
Acme.....60¢ 10¢  
Allen's Pocket (Bright).....50¢ 10¢  
Alligator.....60¢ 10¢ 10¢

**Bonds & Call's:**  
Adjustable S.....35¢ 5¢  
Adjustable 4 Pipe.....40¢  
Brigg's Pattern.....30¢ 10¢  
Combination Black.....40¢ 5¢  
Combination Bright.....40¢  
Cylinder or Gas Pipe.....55¢  
Extra Heavy.....45¢  
Merrick's Pattern.....50¢  
No. 3 Pipe, Bright.....40¢ 5¢  
Rindley Automatic.....30¢  
Boardman's.....35¢ 1/2  
Bull Dog, W. & B.....60¢ 10¢ 10¢  
Donohue's Engineer.....40¢ 10¢  
Eagle.....50¢ 10¢  
Hercules.....40¢ 10¢  
Solid Handles, F. S. & W.....40¢ 10¢  
Stevenson.....60¢ 10¢ 10¢  
**Wrought Goods—**  
Staples, Hooks, etc., list March 17  
'92.....\$5.55 @ 55¢ 10¢  
**Yokes, Neck—**  
Covert Saddle Work, Trimmings 1.00 & 5¢  
Covert Saddle Work, Neck Yoke  
Centers.....70¢  
**Yokes, Ox, and Ox Bows—**  
Fort Madison's Farmers & Freighters'.....  
list net  
**Zinc—**  
Sheet.....lb. 6 1/2c @ 7c

PAINTS, OILS AND COLORS.—Wholesale Prices.

**White Lead, Zinc, &c.**  
Lead, Foreign white, in Oil.....7 1/4 @ 9 1/2  
Lead, American White, in Oil:  
Lots of 500 lb or over.....@ 6  
Lots less than 500 lb.....@ 6 1/2  
Lead, White, in oil, 25 lb tin  
pails, add to keg price.....@ 1/2  
Lead, White, in oil, 12 1/2 lb tin  
pails, add to keg price.....@ 1  
Lead, White, in oil, 1 to 5 lb as-  
sorted tins, add to keg price.....@ 1 1/4  
Lead White, Dry in bbls.....5 1/2 @ 5 3/4  
Lead, American, Terms: On lots of 500  
lbs. and over, 60 days, or 25 for cash if  
paid in 15 days from date of invoice.  
Zinc, American, dry.....@ 4 1/2 @ 4 3/4  
Zinc, Paris, Red Seal, dry.....@ 8 1/2  
Zinc, Paris, Green Seal, dry.....@ 9 1/2  
Zinc, Antwerp, Red Seal, dry.....@ 7 1/2  
Zinc, Antwerp, Green Seal, dry.....@ 8 1/2  
Zinc, V. M. French, in Poppy Oil,  
Green Seal, lots of 1 ton and  
over.....11 1/4 @ 12 1/4  
lots less than 1 ton.....12 @ 12 1/2  
Zinc, V. M. French, in Poppy Oil,  
Red Seal, lots of 1 ton and  
over.....10 1/4 @ 11  
lots less than 1 ton.....10 1/2 @ 11 1/4  
Discounts.—V. M. French Zinc.—Dis-  
counts to buyers of 10 lb. lots of one or  
assorted grades, 15; 25 bbls., 25; 50  
bbls., 45.  
**Dry Colors.**  
Black, Carbon.....@ 7 @ 20  
Black, Drop, Amer.....2 1/2 @ 4  
Black, Drop, Eng.....7 @ 11  
Black, Ivory.....15 @ 21  
Lamp, Com.....3 @ 5  
Blue, Celestial.....5 1/2 @ 8  
Blue, Chinese.....35 @ 40  
Blue, Prussian.....30 @ 35  
Blue, Ultramarine.....3 @ 35  
Brown, Spanish.....16 @ 1  
Brown, Vandyke, Amer.....18 @ 2 1/2  
Brown, Vandyke, Foreign.....24 @ 3 1/2  
Carmine, No. 40.....@ 2.15 @ 2.75  
Green, Chrome, ordinary.....5 @ 6

Green, Chrome, pure.....18 @ 29  
Lead, Red, bbls., 50 lbs. and kegs:  
Lots 500 lb or over.....@ 6  
Lots less than 500 lb.....@ 6 1/2  
Litharge, bbls., 50 lbs. and kegs:  
Lots 500 lb or over.....@ 6  
Lots less than 500 lb.....@ 6 1/2  
Ocher, French Washed.....14 @ 2 1/2  
Ocher, Dutch Washed.....4 1/2 @ 5  
Ocher, American.....@ 10 @ 10.00  
Orange Mineral, English.....@ 9 @ 12  
Orange Mineral, French.....11 1/4 @ 11 1/2  
Orange Mineral, German.....@ 9 @ 12  
Orange Mineral, American.....@ 8 1/2 @ 11 1/2  
Red, Indian, English.....4 1/2 @ 8 1/2  
Red, Indian, American.....3 @ 3 1/2  
Red, Turkey, English.....4 @ 6  
Red, Tuscan, English.....7 @ 10  
Red, Venetian, Amer.....@ 100 @ 110  
Red Venetian, English.....1.80 @ 2.10  
Sienna, Italian, Burnt and  
Powdered.....@ 3 1/2 @ 9 1/2  
Sienna, Ital., Raw, Powl.....3 @ 7 1/2  
Sienna, American, Raw.....14 @ 2  
Powdered.....@ 14 @ 2  
Talc, French.....@ 100 @ 1.25 @ 2.00  
Talc, American.....@ 90 @ 1.10  
Terra Alba, French, @ 100 lb.....95 @ 1.00  
Terra Alba, English.....95 @ 1.00  
Terra Alba, American No. 1.....45 @ 50  
Terra Alba, American No. 2.....45 @ 50  
Umber, Turkey, Bnt. & Pow. @ 2 1/2 @ 3 1/2  
Umber, Turkey, Raw & Powd. 2 1/2 @ 3 1/2  
Umber, Bnt. Amer.....14 @ 2  
Umber, Raw, Amer.....14 @ 2  
Yellow, Chrome.....10 @ 25  
Vermilion, American Lead.....10 @ 25  
Vermilion, Quicksilver, bulk.....@ 72  
Vermilion, Quicksilver, bags.....@ 73  
Vermilion, English, Import.....81 @ 95  
Vermilion Chinese.....88 @ 93  
**Colors in Oil.**  
Black, Lampblack.....10 @ 14  
Blue, Chinese.....30 @ 40  
Blue, Prussian.....32 @ 35  
Blue, Ultramarine.....12 @ 16

Brown, Vandyke.....9 1/2 @ 13  
Green, Chrome.....8 @ 12  
Green, Paris.....@ 24  
Sienna, Raw.....10 @ 13  
Sienna, Burnt.....10 @ 13  
Umber, Raw.....9 1/2 @ 12  
Umber, Burnt.....9 1/2 @ 12  
**Miscellaneous.**  
Barytes, Foreign, @ ton.....\$19.00 @ 21.00  
Barytes, Amer. doated.....19.00 @ 20.00  
Barytes, Crude.....8.00 @ 10.00  
Chalk, in bulk.....@ 2.60 @ 2.75  
Chalk, in bbls.....@ 100 @ 40  
China Clay, English, @ ton 12.00 @ 17.50  
Cobalt, Oxide, @ 100 lb 2.25 @ 2.50  
Whiting, common, @ 100 lb 42 @ 52  
Whiting, Gilders.....54 @ 64  
Whiting, extra Gilders.....55 @ 68  
**Putty.**  
In bulk.....@ 1.90  
In bladders.....2.40  
In cans, 12 lb to 25 lb.....2.50  
In cans, 1 lb to 5 lb.....3.60  
**Spirits Turpentine.**  
In Southern bbls.....@ 43 @ 46  
In machine bbls.....@ 43 @ 46  
**Glue.**  
Low Grade.....@ 12 @ 15 1/2  
Cabinet.....13 1/2 @ 16 1/2  
Medium White.....14 1/2 @ 16 1/2  
Extra White.....18 @ 23  
French.....12 @ 15  
Irish.....13 1/2 @ 16  
**Animal, Fish and Vege-**  
**table Oils.**  
Linseed, City, raw.....@ gal. 67 @ 69

Linseed, City, boiled.....@ 69 @ 71  
Linseed, State and West'n, raw.....@ 67  
Linseed, raw Calcutta seed.....@ 70  
Lard, Prime.....55 @ 56  
Lard, Extra No. 1.....48 @ 50  
Lard, No. 1.....41 @ 43  
Cotton-seed, Crude.....33 @  
Cotton-seed, Summer Yellow,  
prime.....35 1/2 @ 36  
Cotton-seed Summer Yellow,  
off grades.....35 @ 35 1/2  
Sperm, Crude.....@ 57  
Sperm, Natural Spring.....@ 57  
Sperm, Bleached Spring.....@ 57  
Sperm, Natural Winter.....@ 57  
Sperm, Bleached Winter.....@ 57  
Whale, Crude.....38 @  
Whale, Natural Winter.....@ 47  
Whale, Bleached Winter.....@ 49  
Menhaden, Crude, Sound.....25 @ 30  
Menhaden, Light Strained.....29 @ 30  
Menhaden, Bleached Winter.....35 @ 37  
Menhaden, Extra Bleached.....@ 37  
Tallow, prime.....53 @ 54  
Cocoanut, Ceylon.....57 @ 6  
Cocoanut, Cochila.....60 @ 6 1/2  
Cod, Domestic.....80 @ 83  
Cod, Newfoundland.....36 @ 38  
Red Elaine.....34 @ 36  
Red Saponified.....@ 5 @  
Olive, Italian, bbls.....57 @ 60  
Neatsfoot, prime.....45 @ 50  
Palm, prime, Lagos.....@ 5 1/2 @ 6  
**Mineral Oils.**  
Black, 20 gravity, 25 to 30 cold  
test.....@ gal. 9 1/2 @ 10 1/2  
Black, 29 gravity, 15 cold test, 10 1/2 @ 11 1/2  
Black, summer.....9 1/2 @ 9 1/2  
Cylinder, light filtered.....14 1/2 @ 17 1/2  
Cylinder, dark filtered.....11 1/2 @ 16 1/2  
Paraffine, 90-97 gravity.....14 1/2 @ 15 1/2  
Paraffine, 90-93 gravity.....13 1/2 @ 14 1/2  
Paraffine, 88-93 gravity.....12 1/2 @ 13 1/2  
Paraffine, red, No. 1.....14 1/2 @ 15 1/2  
In small lots 1/2c advance.

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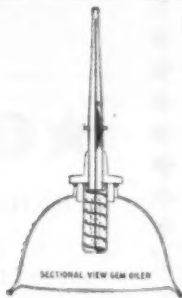
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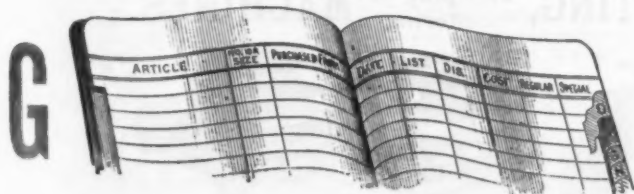
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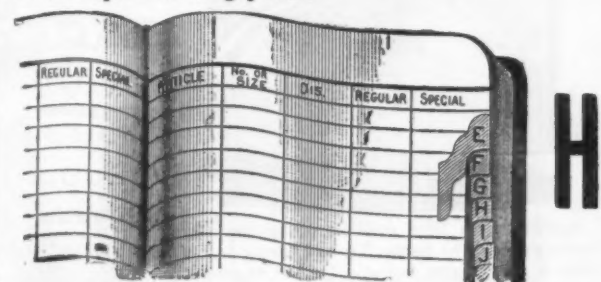
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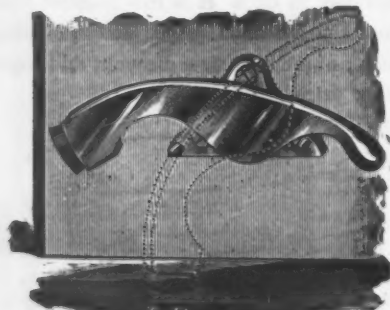
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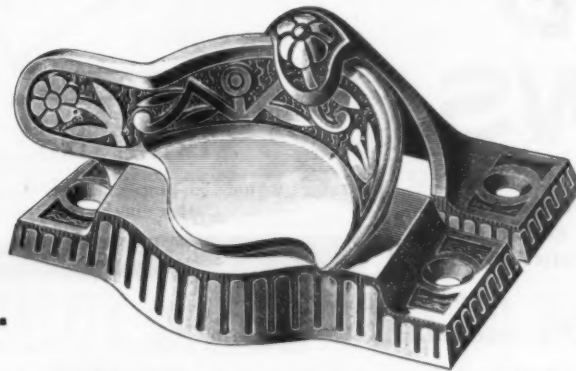
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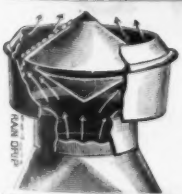
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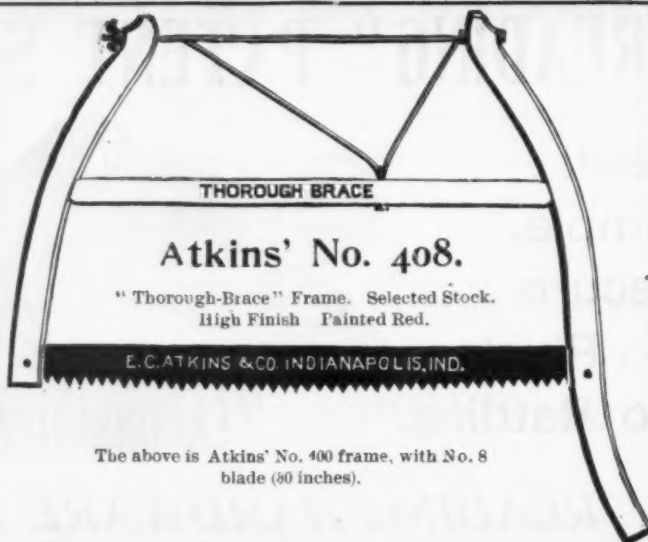
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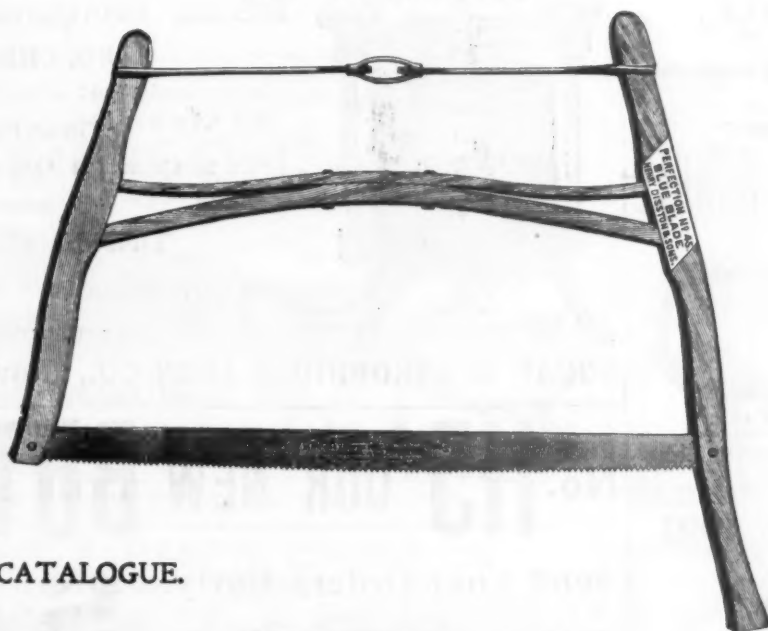
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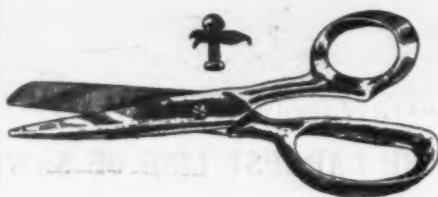
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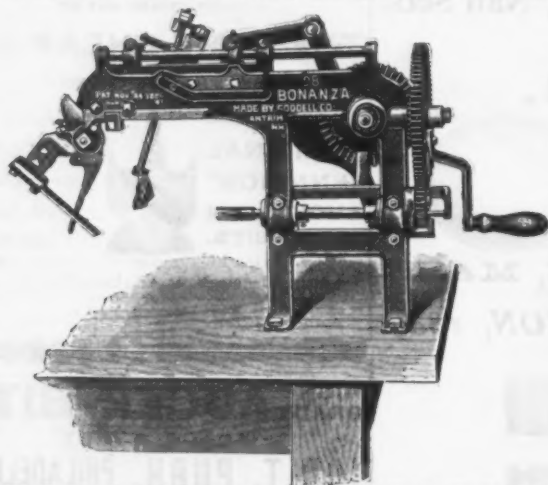
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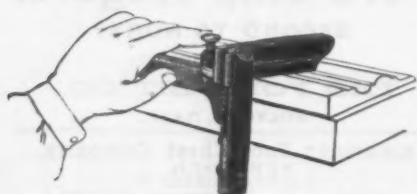
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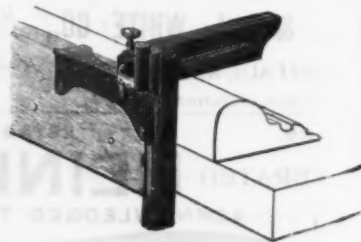
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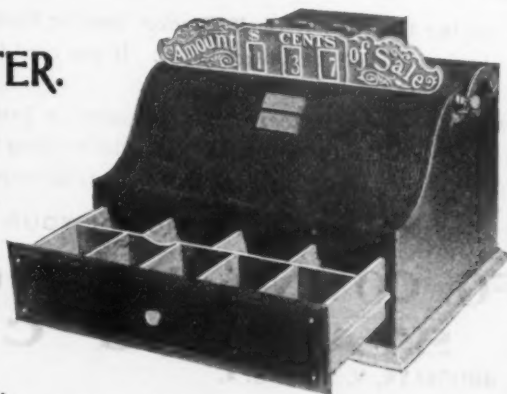
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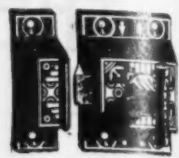
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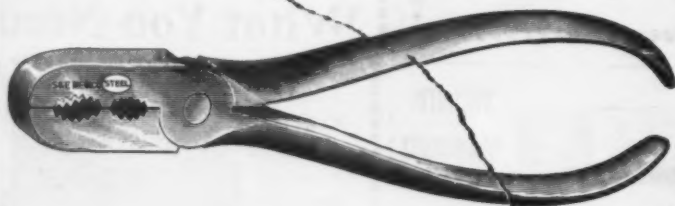


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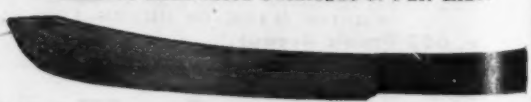
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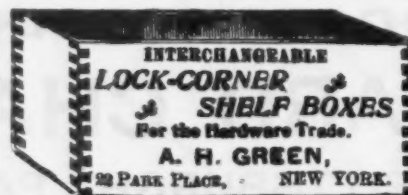
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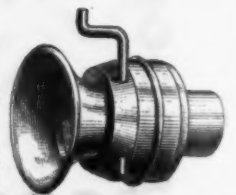
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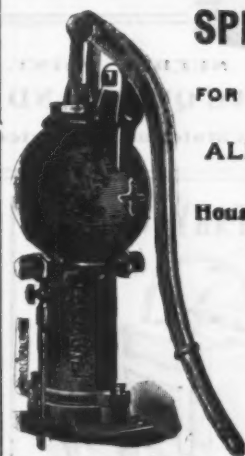
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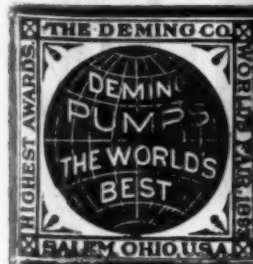
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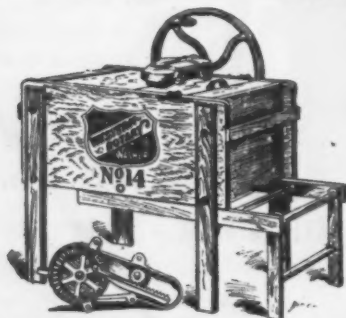
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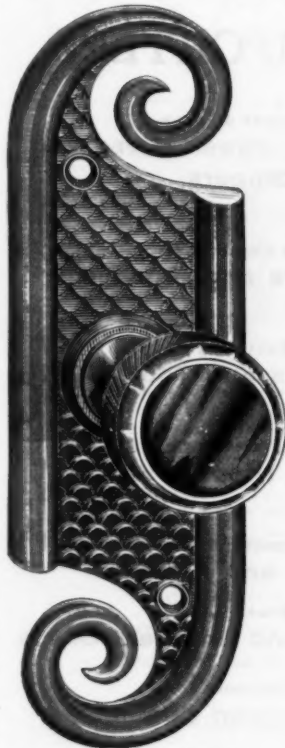
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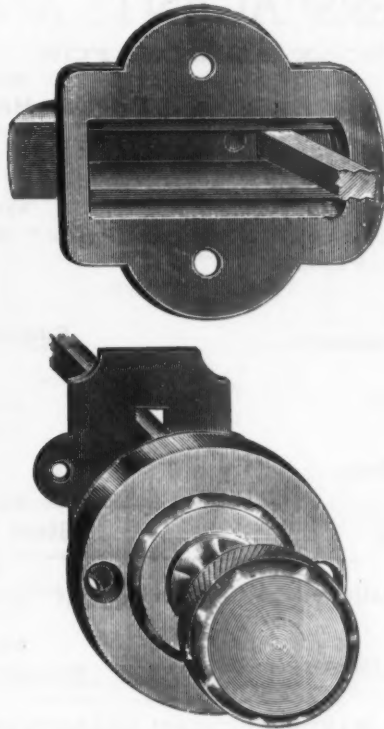
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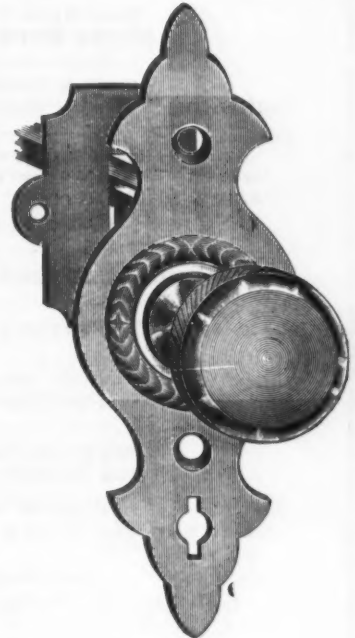
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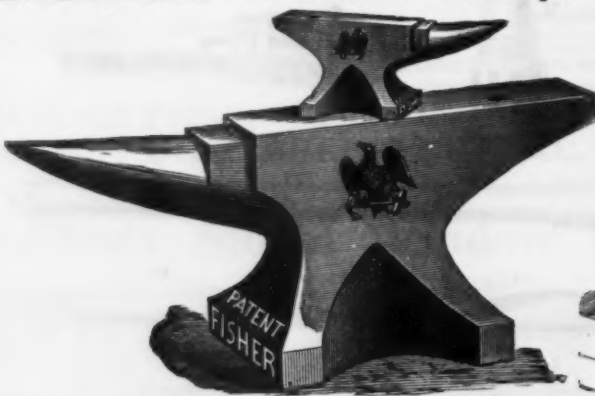
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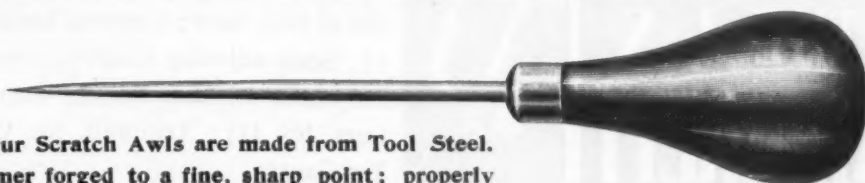
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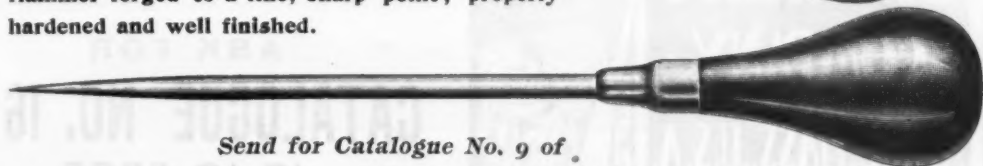


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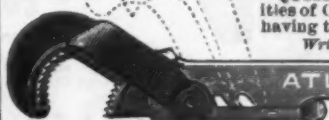
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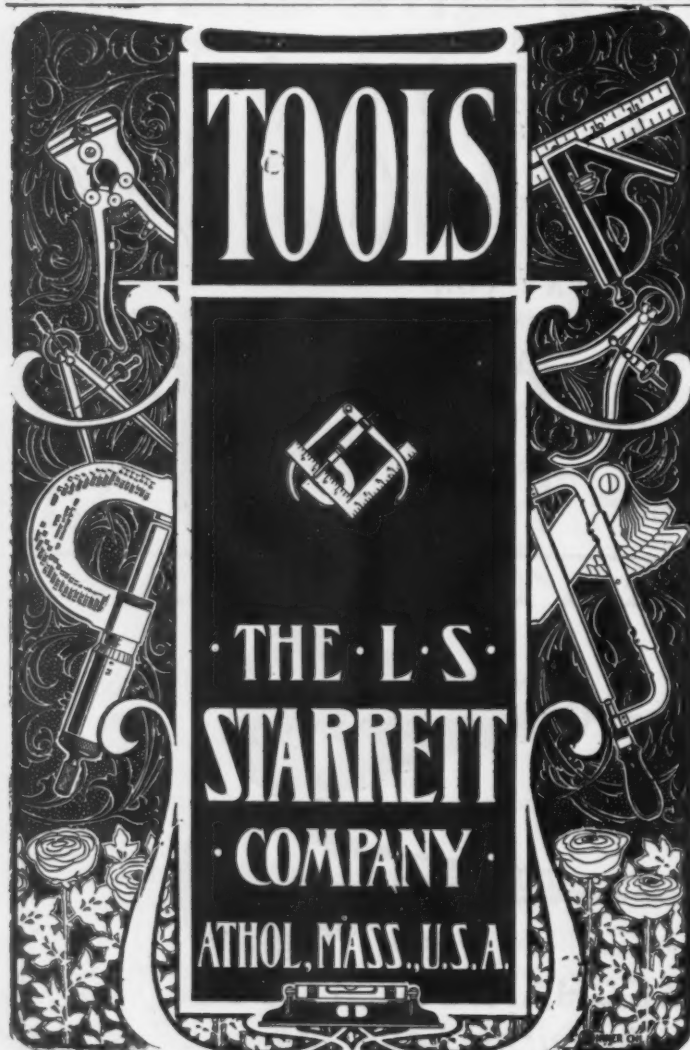


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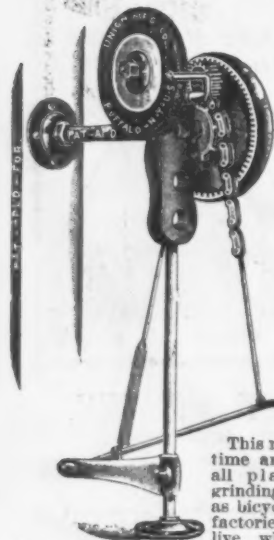
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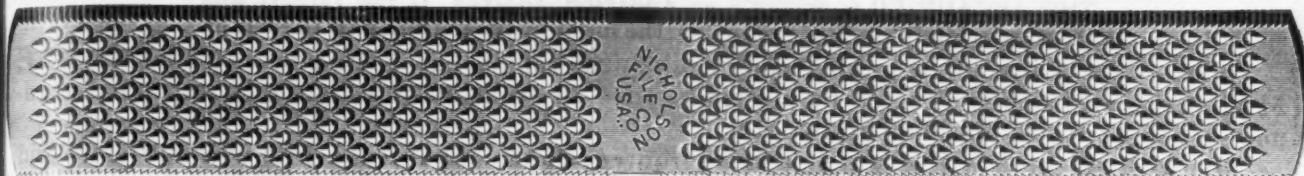
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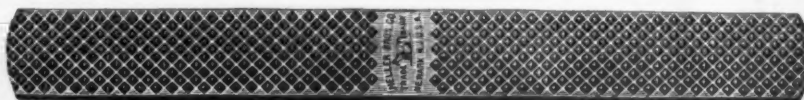
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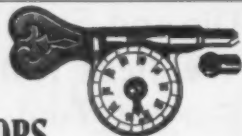
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WOODMAN'S  
SPEED  
INDICATORS.

For ascertaining correct speed of Dynamos, Steam Engines, Shafting, Floor Machines, etc. Supplied with Rubber Tips, Split Caps and Plain Caps, etc. Send for catalogue and prices.

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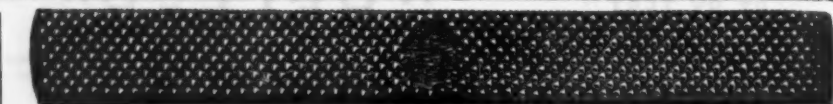


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HEAVY STEEL  
DOG.

MANUFACTURED BY  
WM. G. LE COUNT  
Successor to C. W.  
Le Count,  
SOUTH NORWALK,  
CONN.

Send for Catalogue "B"  
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MACHINISTS' TOOLS.



Sole manufacturers of the celebrated

STOKES BROTHERS HORSE RASPS AND ST. CRISPIN SHOE RASPS  
STOKES BROS. MFG. CO.,  
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HIGHEST AWARD:  
SILVER MEDAL & DIPLOMA.

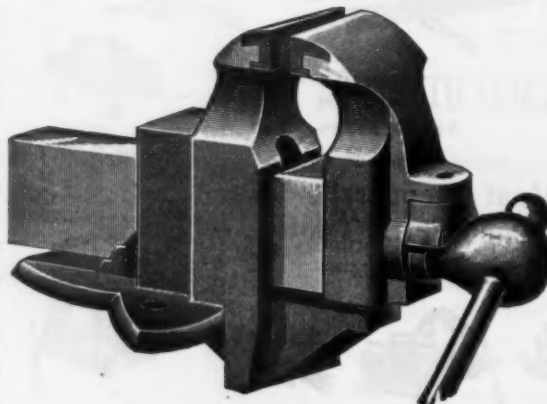
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Extra Jaw.

The best general purpose wrench on the market. It will turn a nut, hold a pipe or twist a rod. It is not clumsy, but flat and neat. It is the only adjustable wrench (with its range of work) that can be conveniently carried in the pocket. When jaws wear out, old ones can be replaced with new. Nickel plated and perfectly constructed. Write us for prices.

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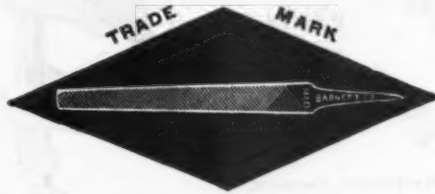
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Also Manufacturers of Passenger  
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draulic and Hand Power.

# BLACK DIAMOND FILE WORKS,

Established 1863. Incorporated 1895.

Twelve Medals of  
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Special Grand Prize  
GOLD MEDAL,  
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**BUTTON'S**  
**Pat. Wire Cutter**  
**AND PLIER COMBINED.**

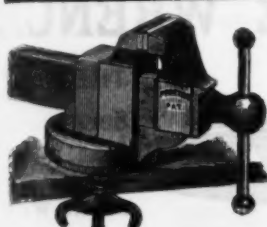


Established by DANIEL B. KING, 1829.

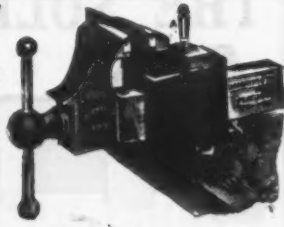
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Also manufacturers of BLACKSMITHS and  
MACHINISTS' STOCKS and DIES, PLUG and  
TAPER TAPS, HAND, NUT and SCREW TAPS  
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Price-List on Application.



*We make all  
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of Vises.*

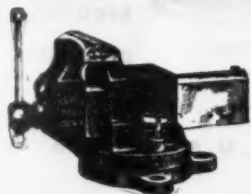


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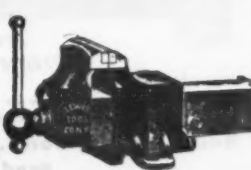
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**LEWIS PATENT QUICK-ACTING VISE**



**DURABLE, POWERFUL  
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as any Screw Vise.**

Commence to draw as soon as  
lever is started and have suffi-  
cient gether for any kind of  
work.



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Decided Improvement. Less friction. Can be  
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Extra wheels in the handle. Send for catalog.

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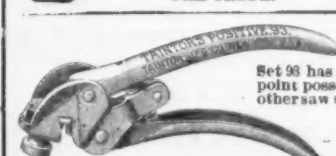
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Seals, Stencil Dies  
for Stencil Cutting,  
Die Letters, Stamping Letters, Brands,  
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Steel Letters and Figures,  
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MACHINE ROUTING FOR  
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**THE Taintor**  
Positive Saw  
Set 36 has every good  
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othersaw set, besides a  
number  
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itself.  
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**Hand Elevators and  
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made to be sold by the Hard-  
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position by any carpenter. Cat-  
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STENCILS-BURNING BRANDS  
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SEALS-MACH. PLATES-CHECKS  
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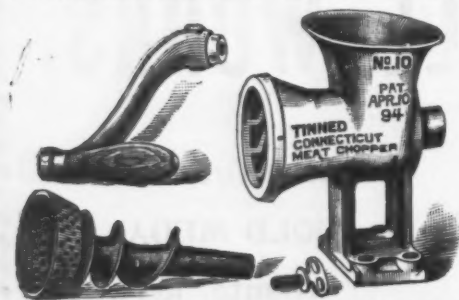
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## CONNECTICUT MEAT CHOPPERS

## THE NEW CONNECTICUT CHOPS and PULVERIZES.



ONLY  
TWO  
PARTS  
TO  
CLEAN

In three sizes, 8, 10, 12. For Butchers, Marketmen, Farmers, Poultry Breeders, Hotels, Restaurants and Public Institutions. For smaller sizes order "THE NEW CONNECTICUT," No. 20, 40, 60.

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Housekeepers can now  
DO IT ALL with a - -

## SINGLE MACHINE.



DOES  
IT  
ALL

FOOD  
No. 2.

MEAT  
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PEANUT BUTTER,  
CHOCOLATE,  
No. 3.  
DATES,  
COCOANUT,  
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ONLY TWO PARTS TO CLEAN.

Manufactured by  
O. D. WOODRUFF,  
Pottstown, Pa.



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are the strongest, best made machines for the purpose on the market to-day. They have Cedar Tubs with Galvanized Hoops. Inside castings, Tinned Malleable Iron. Leg brackets, malleable iron and bolted to tub with Tinned Bolts. Will wash as well as by hand, with less than  $\frac{1}{2}$  the labor.

Manufactured by

CLARK, QUIEN & MORSE,

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## Loss of Time

on the part of employees is often less due to dishonesty on their part than to lax methods on the part of employer.

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to prevent this loss is to install Simplex Time Recorders throughout the shops.



THE LANG & GOODHUE MFG. CO., Engineers and Machinists, Burlington, Vt., say of this device: "It has inculcated punctuality in our entire force."

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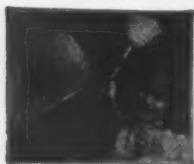
Is everything "good enough" in your system of keeping time? If not, let us hear from you.



SIMPLEX TIME RECORDER CO.,

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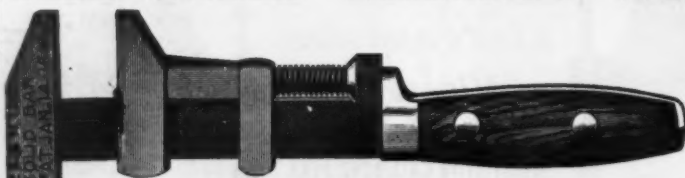
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WIRE FLY KILLER.

A Quick Seller.  
Good Profits.

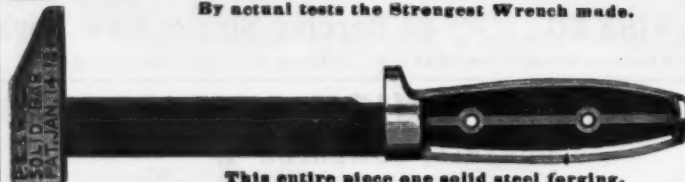
Trade sample on application.  
"Mamma says she wouldn't keep house without the FLY KILLER."

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## THE SOLID HANDLE WRENCH.



By actual tests the Strongest Wrench made.



This entire piece one solid steel forging.  
Every Wrench Warranted.

Manufactured by

THE PECK, STOW & WILCOX CO.,

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Send for Circulars and Prices.

THE ONLY  
Screw  
Wrench  
made with  
the bar of  
ONE PIECE,  
thus  
securing  
greatest  
possible  
strength.

## Hudson's Rocking Table Apple Parer



WITH PUSH OFF

THIS Machine is so arranged that the Parings and Juice cannot fall upon it. Has an

IMPROVED CLAMPING DEVICE

so that the table will not be jammed.  
It is stronger, More Durable, has Less Gears and Working Parts, will Pare Closer to the Fork, Keep Cleaner, Do Better Work and More of it than any machine in the market.

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Also Makers of Hudson's Little Star Parer, Corer and Slicer  
LIVINGSTON NAIL CO., Agents, 104 Reade St., New York.

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KILLS without crushing, and no danger of soiling finest fabrics.

KING FLY KILLER is almost invisible, so flies are quickly killed.

—Manufactured by—

R. R. MONTGOMERY & CO., Decatur, Illinois.



Sample free to dealers.

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PATENTED—  
HARDWARE  
—SPECIALTIES

## Rapid Grinding and Pulverizing Mills



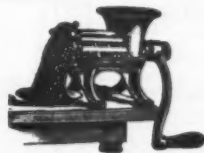
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90 Sizes & Styles for Hand & Power from \$1.25 to \$125.00

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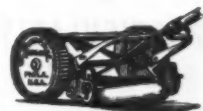
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The Sterling Chopper

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The Sterling Slicer.

TWO UNEQUALED KITCHEN TOOLS.

Have you seen the slicer? It's just out.

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Manufactured by

KEEN & HAGERTY MFG. CO.,

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Chicago Salesroom, 1115 Chamber of Commerce.

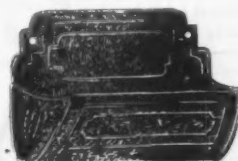
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We make all descriptions of Piced,  
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With those who have pushed them well they have become really a Staple with special profit; and the trade is awaking to the fact that

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HANDLE.**



We manufacture high quality goods in largest quantities. Have been at it for twenty years.

We supply more of the trade than all other makers combined.

The Hardware Trade is our specialty.

Correspondence Solicited.

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THE BEST MADE.



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Japanned and Ornamented.  
Made in Two Sizes.  
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The Standard of Excellence Everywhere  
SOLD BY ALL LEADING JOBBERS.  
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**THE WHITE MOUNTAIN FREEZER CO.,**  
NASHUA, N. H.

Quickest  
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Best  
Results

Economical  
Durable

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Wanted in every town to handle the best selling and most complete line of

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FOR PARTICULARS APPLY TO  
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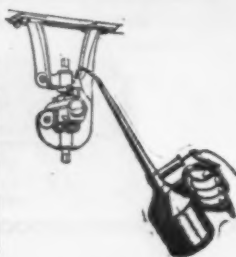
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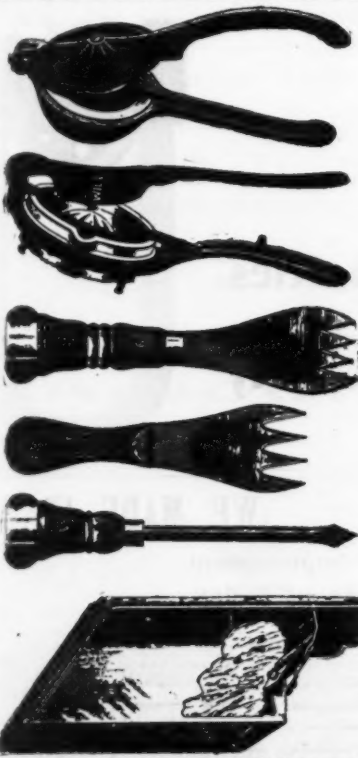


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**Ice Tools and  
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MADE IN THE UNITED STATES

ARE MANUFACTURED BY

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To whom send for catalogue of

**House Furnishing Specialties  
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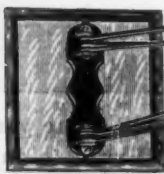
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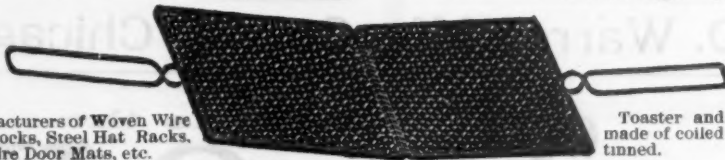
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Tea or Coffee Pot Stand, one  
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**TOWEL RACK.**  
HAS NO EQUAL.



Manufacturers of Woven Wire  
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tinned.

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(Patented September 14, 1897.)



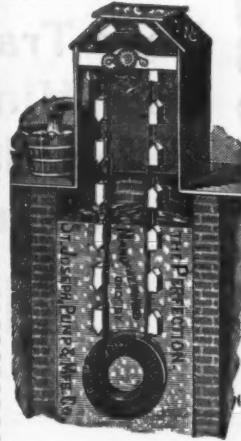
**SWINGING  
ARCH  
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REMOVABLE  
CYLINDER**

**ESPECIALLY  
CONVENIENT  
FOR  
LARD  
PRESSING.**

Send  
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NATIONAL SPECIALTY MFG. CO., Lehigh Ave. and Third St., Philadelphia, Pa.

**You know that**



the bulk of wa-  
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Sell your  
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**WATER  
PURIFIER,**

something  
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Jobbers all  
know a good  
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**Bucket Pump**

Write for sample outfit to-day.  
Catalog free.

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**The Virginia Rotary  
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Easy Running. Simple. Made of  
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Welded Wire Hoops. The Dolly  
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"WHITE MOUNTAINS" have  
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the demand is still increasing.  
They sell themselves and stay  
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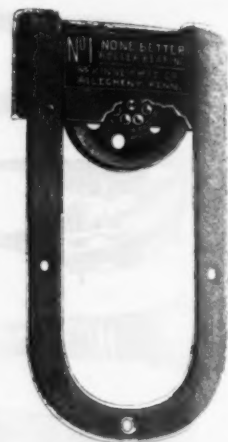
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# Steel Goods.

Door Hangers,  
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Ball-Bearing, Rapid-Grinding

**COFFEE, DRUG**

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Large Variety of Styles  
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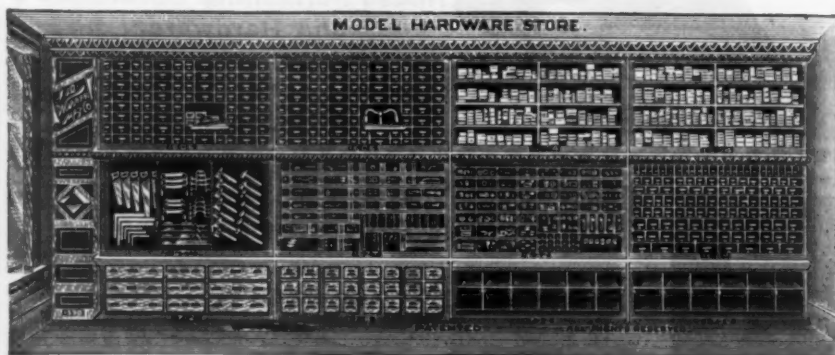
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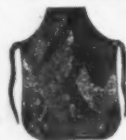
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**VAPOR STOVES,  
GAS RANGES,  
STEEL RANGES.**

**THE SCHNEIDER & TRENKAMP CO.**  
Chicago, Illinois. Cleveland, Ohio.



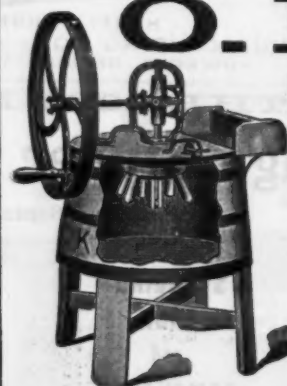
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LEATHER APRONS.**

Largest Mfrs. in U. S.

Split Leather, Sheep, Hog, Cow,  
Calf and Horse Hide.

**THE HULL & HOYT CO.,**  
Danbury, Conn.

Why is the  
**O. K.**  
Rotary  
Washer  
The  
Best?



Patented 1896.

Because it is the only **ROTARY WASHER**  
that has **Revolving Steri Ball Gearing**,  
therefore light running and noiseless. No escape  
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turns either way; dasher reverses automatically,  
cleaning clothes without rubbing them to pieces.  
Made to last.

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**EGG BEATERS.** We make the largest line in the world. Send  
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**D**O YOU know what a Poised Carrier is? If not, buy and sell the Coburn Rolling Door Hangers and you will get them, and you do not get them with any other make. They will when used in conjunction with the Coburn Round Trough Trolley Track be found to be the "*Ne Plus Ultra*" in door hangers.

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Is unquestionably the best machine of its kind ever offered to the public. It will cut without crushing raw or cooked meat, sea food, fruit, vegetables, etc., into coarse or fine pieces, according to the cutter used, of which three accompany each chopper.

It has eliminated all the objectionable features of other choppers and has added several improvements that are distinctly its own. It is always in order and the knives require no sharpening.

An additional and exclusive feature of the **Star Food Chopper** is a plate hinged at the top of the hopper which, when pressed on the food to be cut, forces it upon the feed screw, thus preventing the possibility of injuring or soiling the fingers, which is liable to occur in using other choppers.

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Of best quality, latest designs, and fine finish. Also a full line of **Patented Household Novelties** of superior quality and merit.

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Send for our 1899 Catalogue.

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A one-pound Coffee Mill with wood frame and glass front. Patent pending.

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Concise and Practical Explanations for Plumbers, Tanners and Hardware Dealers on How to Wire Buildings for Bells, Alarms, Annunciators, and for Gas Lighting from Batteries.

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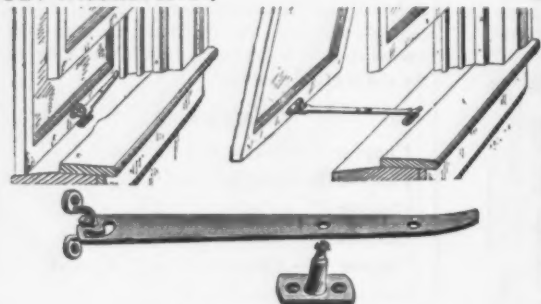
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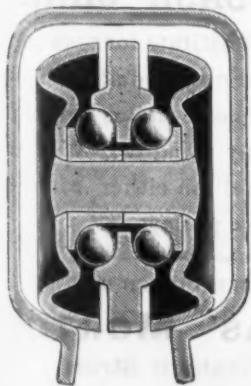
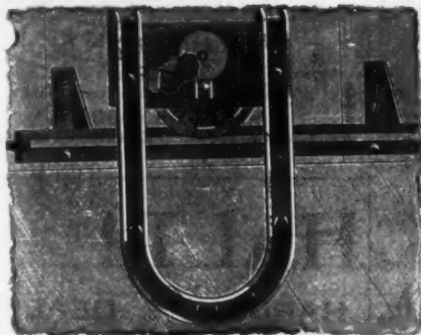
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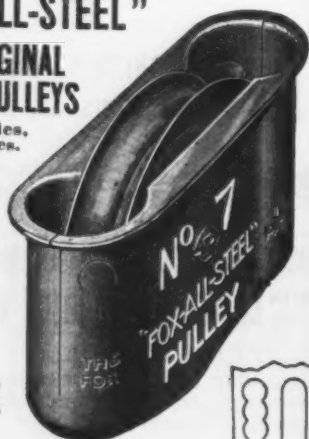
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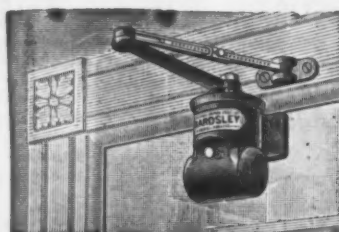
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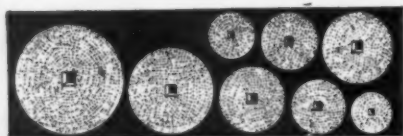
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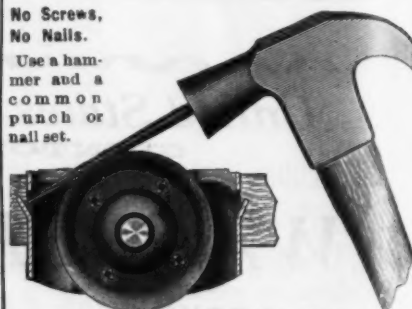
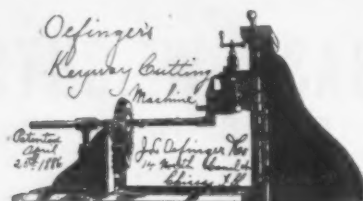
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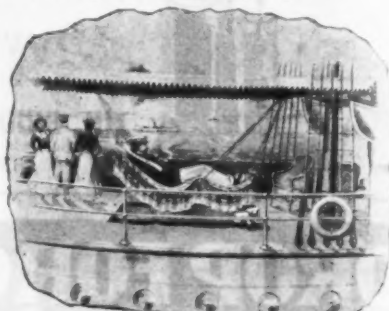
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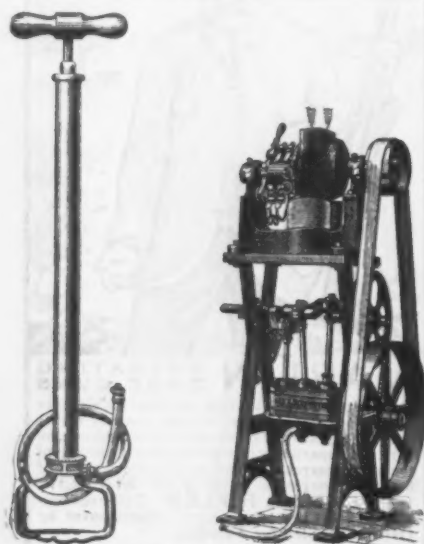
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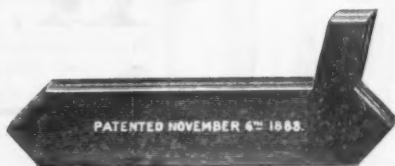


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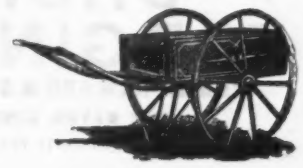
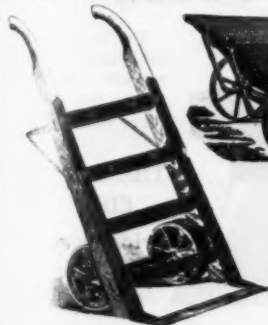
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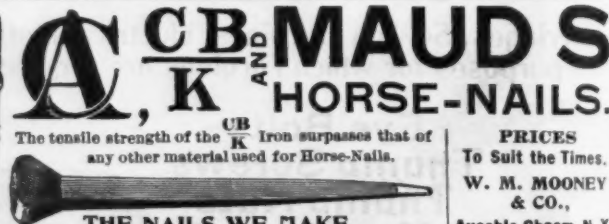
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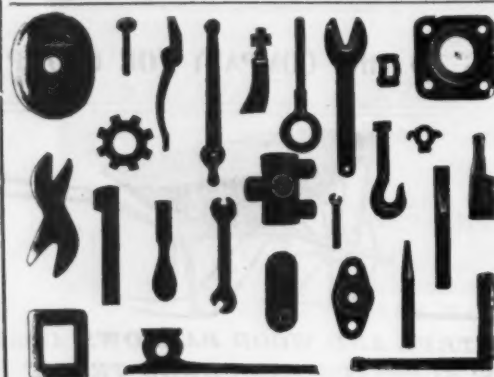
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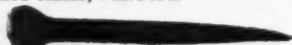
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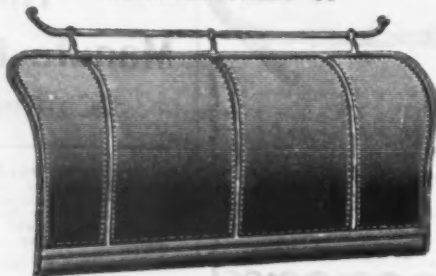
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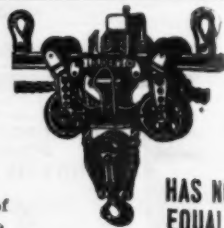
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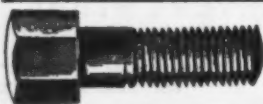


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<b>B</b>	Babcock & Wilcox Co. 46	Baecker, Adamson & Co. 96	Baird, C. R. & Co. 23	Baird, U. Machinery Co. 86	Baker, Jas. H. Mfg. Co. 86	Ball Bearing Co. 58	Bardsley, Jos. 124	Barker & Chard Mch. Tool Co. 77	Barnes, Wallace Co. 5	Barnes, B. F. Co. 78	Barnes, W. F. & John Co. 66	Barnes Mfg. Co. 107	Barnett, G. & H. Co. 115	Barney & Reed Mfg. Co. 123	Barnum, E. T. 194	Baugh Mch. Tool Co. 79	Bayley, Wm. & Sons Co. 23	Beaudry & Co. 67	Becker & Brainard Milling Mch. Co. 70	Behlen Machine Co. 37	Bent, E. & Sons Co. 129	Bent, Miles & Co. 76	Benis & Call Hardware & Tool Co. 112	Berger Bros. Co. 97	Berry, G. H. & Co. 142	Bess, L. 56	Bethlehem Steel Works. 91	Bethlehem Fdry. & Mch. Co. 130	Bethlehem Steel Co. 32	Bevin Bros. Mfg. Co. 130	Bickford Drill & Tool Co. 65	Bicknell Hardware Co. 72	Bicycle Step Ladder Co. 116	Bigelow, J. F. 116	Biggins & Keeler Mfg. Co. 60	Billings & Spencer Co. 127	Birmingham Iron & Steel Braking Co. 88	Bishop, Geo. H. & Co. 163	Bisell, E. & Co. 89	Blackman & King. 4	Blackwell, G. G. Sons & Co. 28	Blair, Reed F. & Co. 70	Blake, M. J. & M. 78	Blake & Johnson. 15	Bliss Co. E. W. 77	Bliss, R. Mfg. Co. 123	Boker, Hermann & Co. 23	Boie, Ross & Co. 82											
<b>B</b>	Bommer Bros. 142	Booth, The Lloyd Co. 32	Bortner, Cyrus. 35	Boston Belting Co. 50	Boston Blower Co. 68	Boston Bridge Works. 19	Boston Gear Works. 64	Boston & Lockport Block Co. 49	Botcher, C. 88	Bowler, Geo. H. 96	Box, Alfred & Co. 54	Braddock Mach. & Mfg. Co. 14	Bradlee & Co. 25	Bradley Co. 70	Braeburn Steel Co. 31	Brammer, H. F. Mfg. Co. 120	Braunsdorf-Mueller Co. 98	Bridgeport Brass Co. 2	Bridgeport Chain Co. 129	Bridgeport Deoxidized Bronze & Metal Co. 2	Bridgeport Gun Implement Co. 125	Bridgeport Mfg. Co. 101	Bridgeport Safety Emery Wheel Co. 56	Briggs, Marvin. 82	Bristol Co. 1	Broderick & Bascom Rope Co. 7	Brooks, M. S. & Sons. 8	Brown, Chas. D. 121	Brown & Co., Inc. 96	Brown, E. E. & Co. 123	Brown Hoisting & Conveying Mch. Co. 53	Brown, R. H. & Co. 96	Brown & Sharpe Mfg. Co. 81	Buck Bros. 101	Buck, Chas. 101	Buffalo Emery Wheel Co. 55	Buffalo Forge Co. 93	Buhl Malleable Co. 51	Bullard Mch. Tool Co. 79	Burden Iron Co. 128	Burditt & Williams. 131	Burke, P. F. 123	Burnham, Geo. Co. 63	Burns Hydro Carbon Burner Co. 44	Butterfield & Co. 63	Byram & Co. 39													
<b>C</b>	Cabeen & Co. 31	Cahall Sales Dept. 164	Caldwell Mfg. Co. 96	California Wire Works. 52	Canfield, H. O. 132	Capewell Horse Nail Co. 1	Carborundum Co. 57	Card, S. W. Mfg. Co. 61	Carlin's Sons, Thomas Co. 67	Carter & Hakes Machine Co. 75	Cary Mfg. Co. 95	Cary Spring Works. 5	Cattaraugus Cutlery Co. 101	Central Hardware Co. 104	Chambers Bros. Co. 17	Champion Blower & Forge Co. 66	Champion Iron & Steel Co. 25	Chandler & Farquhar. 109	Chapman, J. B. & Co. 54	Chapman Valve Mfg. Co. 43	Charter Gas Engine Co. 42	Chatillon, John & Sons. 4	Cheney, S. & Son. 35	Cherry Valley Iron Co. 25	Chesley Machinery Co. 85	Chester Steel Casting Co. 31	Chicago Drop Forge & Fdy. Co. 25	Chicago Flexible Shaft Co. 53	Chicago House Wrecking Co. 90	Chicago, Milwaukee & St. Paul Ry. 91	Chicago Pneumatic Tool Co. 78	Chicago Scale Co. 132	Chicago Screw Co. 18	Chicago Spring Butt Co. 121	Chicago Time Register Co. 104	Chilcott-Evans Chain Co. 108	Chisholm & Moore Mfg. Co. 142	Chrome Steel Works. 91	Church, Isaac. 18	Church, S. R. 25	Cincinnati Mach. Tool Co. 72	Cincinnati Milling Mach. Co. 97	Cincinnati Planer Co. 74	Clapp, E. D. Mfg. Co. 123	Clark, John W. 3	Clark & Cowles. 4	Clark & Parsons Co. 141	Clark, Quin & Morse. 116	Clark, W. J. Co. 97	Clayton Air Compressor Wks. 47	Cleveland Ball & Screw Co. 68	Cleveland City Forge & Iron Co. 5	Cleveland Crane & Car Co. 83	Cleveland Elevator Bucket Co. 49	Cleveland Stamping & Tool Co. 98	Cleveland Stone Co. 124	Cleveland Twist Drill Co. 69	Clinton Wire Cloth Co. 12	Cobb & Drew. 16
<b>C</b>	Coburn Trolley Track Mfg. Co. 121	Cooling Mfg. Co. 84	Coes Wrench Co. 111	Coldwell Lawn Mower Co. 130	Coleman Hardware Co. 121	Conn. Valley Mfg. Co. 97	Consolidated Iron & Steel Co. 23	Consolidated Raily Electric Lighting & Equipment Co. 37	Continental Tool Co. 130	Cook, A. D. 47	Cook, Asa S. & Co. 71	Cook, H. C. & Co. 100	Cornell, J. B. & J. M. 77	Cotton, Barclay W. & Co. 32	Covert Mfg. Co. 131	Covert's Saddlery Works. 95	Cox, Justice, Jr. & Co., Ltd. 29	Cramp, Wm. & Sons S. & E. B. Co. 8	Crane, W. M. Co. 38	Crescent Brass & Iron Co. 97	Crescent Mfg. Co. 18	Crescent Phosphorized Metal Co. 8	Crescent Steel Co. 30	Cresson, Geo. V. Co. 48	Cronk Hanger Co. 112	Crosby Steam Gage & Valve Co. 41	Cross & Spels Machine Co. 67	Cunliffe, R. M. 83	Curtis & Curtis. 61	Cushman Chuck Co. 64																													
<b>D</b>	Dallett, Thos. H. & Co. 72	Dame, Stoddard & Co. 127	Danielson Mch. & Tool Co. 84	D'Amour & Littlefield Mch. Co. 65	Darby, Edw. & Sons. 12	Dart, E. M. Mfg. Co. 41	Davis, W. P. Machine Co. 67	Davis & Buxton Stamping Co. 125	Davol, John & Sons. 2	Dawson, A. L. & Co. 86	Deafance Mch. Wks. 64	DeKalb Fence Co. 11	Deming Co. 107	Denman & Davis. 28	Detrick & Harvey Machine Co. 65	Diamond Drill & Mch. Co. 33	Diamond Machine Co. 57	Diamond Tack & Nail Wks. 19	Dickinson, T. L. 55	Diemelt & Eisenhardt. 63	Dillon-Griswold Wire Co. 11	Dimmick, J. K. & Co. 32	Diaston, Henry & Son. 99	Divine Bros. Co. 55	Dixon, Jos. Crucible Co. 49	Doan, J. B. & Co. 84	Dodge Machine Screw Co. 63	Dodge Mfg. Co. 51	Doeblir Mfg. Co. 64	Donaldson & Newton. 88	Draper Machine Tool Co. 78	Drouve, G. Co. 133	Dudgeon, Richard. 63	Duff Patents Co. 40	Dunbar Bros. 69	Dunham Nut Co. 17	Dupont Mfg. Co. 70	Durant, W. N. 43	Dwiggins Wire Fence Co. 8																				
<b>E</b>	Eagle Anvil Works. 110	Eastern Bridge & Structural Co. 19	Eastern Forge Co. 84	Eastern Machinery Co. 50	Eccles Richard. 129	Eckstein, C. G. 54	Eddy Electric Mfg. Co. 45	Edson Mfg. Co. 104	Elmer & Amend. 38	Electric Controller & Supply Co. 47	Ellis & Halfenbarger. 11	Empire Pipe Bending & Supply Co. 4	Energy Elevator Co. 115	Ensign, Bickford & Co. 104	Enterprise Mfg. Co. 117	Erie Specialty Co. 103	Eriskson, Edw. E. 49	Estey Wire Works Co. 7	Etting, Edw. J. 82	Eucker, L. A. Stamp Wks. 115	Evans, S. F. 48	Everson, B. M. 87	Excelsior Needle Co. 12	Exeter Machine Works. 68																																			
<b>F</b>	Fairbanks Co. 60	Fairmount Machine Co. 48	Farrel Foundry & Mch. Co. 31	Fay, J. A. & Egan Co. 60	Ferracute Mach. Co. 70	Ferro Carbon Casting Co. 35	Field, C. H. 59	Filer & Stowell Co. 48	Finished Steel Co. 23	Fish, H. C. Machine Works. 77	Fitch, W. & E. T. Co. The. 141	Flagg, Stanley G. & Co. 142	Flint & Walling Mfg. Co. 107	Folding Paper Box Co. 106	Ford Bit Co. 101	Forest City Foundry & Mfg. Co. 118	Forest City Steel & Iron Co. 88	Forster Pulley Works. 48	Foster-Miller Engineering Co. 40	Fox Machine Co. 124	Frankford Steel Co. 26	Frank-Kneeland Mach. Co. 38	Franklin, H. H. Mfg. Co. 91	Frick, H. C. Coke Co. 94	Frost Wire Fence Co. 9	Fulton Iron & Engine Works. 51																																	
<b>G</b>	Gardner Bros. 85	Garland Chain Co. 102	Garrison, A., Foundry Co. 33	Garry Iron & Steel Roofing Co. 9	Garvin Machine Co. 72	Gem Mfg. Co. 95	General Electric Co. 45	General Supply Co. 58	Geometric Drill Co. 65	Gerlach, Peter & Co. 47	Gilbert & Bennett Mfg. Co. 12	Gilmour, J. 39	Gleason-Peters Air Pump Co. 136	Gleason Tool Co. 142	Goepel & Raegener. 7	Goodell Co. 102	Goodell-Pratt Co. 105	Goodwin & Kintz Co. 93	Gould & Eberhardt. 65	Graham, John H. & Co. 109	Grand Crossing Tack Co. 16	Grand Rapids Hardware Co. 124	Gray, Robt. J. 87	Green, A. H. 106	Greiner, F. 83	Griffin Mfg. Co. 101	Griswold Wire Co. 5																																
<b>H</b>	Hagen & Reid. 93	Haines Gauge Co. 87	Halk & Naumann. 8	Hall, Thomas. 109	Hall's, Samuel, Sons. 14	Hamlin, Geo. R. 7	Hammer & Co. 111	Hannan & Finton. 85	Hanton, M. C. 92	Harrington, E. Son & Co. 52	Harrington & King Perforating Co. 5	Harrington & Richardson Arms Co. 125	Harris Machinery Co. 86	Harris, Samuel & Co. 42	Harrison Safety Boiler Wks. 46	Hartford Steam Boiler Insp. and Ins. Co. 41	Hartigan, W. R. 119	Hartman Mfg. Co. 8	Harvey, Arthur C. Co. 27	Haskell, Wm. H. Mfg. Co. 18	Haws, W. H. Fire Brick Co. 35	Hay, Budden Mfg. Co. 111	Hazard Mfg. Co. 7	Heald, L. S. & Son. 59	Heat Transmission Co. 44	Heinisch's, R. Sons. 101	Heller Bros. Co. 113	Heller Box Co. 106	Henderson's A. L. Sons. 63	Henderson Bros. 34	Hendey Machine Co. 94	Hendricks Bros. 2	Hendryx, A. B. Co. 8	Hess, Snyder & Co. 53	Heyl & Patterson. 38	Hibbard, W. H. 78	Hickman, Williams & Co. 27	Hiertz, T. & Son. 85	Hill, Henry F. 62	Hill, N. N. Brass Co. 130																			
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<b>I</b>	Ideal Machine Works. 62	Ideal Mfg. Co. 125	Illinois Malleable Iron Co. 37	Illinois Screw Co. 132	Illinois Steel Co. 88	Illinois Zinc Co. 3	Imperial Bit & Snap Co. 131	Indianapolis Drop Forging Co. 37	Ingersoll-Sergeant Drill Co. 47	International Silver Co. 108	Iowa Farming Tool Co. 131	Ironsides Co. 4	Isaac Joseph Iron Co. 98	Ives, H. B. & Co. 95	Ivins, Ellwood. 25																																												
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<b>K</b>	Kay, G. Ashton. 39	Keagy & Lear Machine Co. 54	Keeley, Jerome & Co. 29	Keen & Hagerty Mfg. Co. 117	Kelley, B. F. & Son. 88	Kennedy, Julian. 88	Kennedy, Walter. 40	Kennedy Valve Mfg. Co. 142	Keystone Drop Forge Works. 54	Keystone Mfg. Co. 109	Kidd Bros. & Burgher Steel Wire Co. 6	Kidder, R. E. 44	Kilbourn & Bishop Co. 36	Kilbourne & Jacobs Mfg. Co. 130	Kilmer Wire Mfg. Co. 11	Kimball, C. J. Co. 104	Kimball Bros. & Sprague. 19	King, J. M. & Co. 115	Kokomo Fence Mach. Co. 8	Konigslow, E. & Bro. 98	Kupferle, Jas. C. 98																																						
<b>L</b>	La Belle Steel Co. 30	Ladd, W. C. 100	Lake City Engineering Co. 43	Lamond, David. 40	Landis Tool Co. 56	Lane Brothers Co. 124	Lang Cutlery Works. 100	Lansing Wheelbarrow Co. 127																																																			



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Les, J. Tatnall & Co.	29	Nash, Geo. & Co.	Pleuger & Henger Mfg. Co.	132	Simplex Time Recorder Co.	116	Utica Drop Forge & Tool Co.	111
LeCount, Wm. G.	114	National Cutlery Co.	Plume & Atwood Mfg. Co.	2	Singer, Nimitz & Co.	80	V	
Leffler, Chas. & Co.	53	National Elastic Nut Co.	Plymouth Mills.	14	Skinner Chuck Works.	62	Valentine, M. D. & Bro.	95
Leis, Jno. S., Son & Co.	142	National Horse Nail Co.	Pneumatic Crane Co.	52	Slate, Dwight Mch. Co.	72	Van Dorn Iron Works Co.	132
Leonard, John & Co.	88	National Machinery Co.	Poiner & Lester.	37	Slocumb, J. T. & Co.	114	Van Wagoner & Williams	
Leonhardt & Co.	123	National Pancast Ventilator Co.	Pollock, W. B. Co.	42	Sloss Sheffield Steel & Iron Co.	38	Hardware Co.	149
Leschen, A. & Sons Rope Co.	7	National Pipe Bending Co.	Pond Machine Tool Co.	76	Smith & Caffrey.	88 & 87	Variety Machine Co.	34
Levis, Henry & Co.	32	National Saw Co.	Poole, Robt. & Son Co.	46	Smith & Egge Mfg. Co.	104	Virginia Iron, Coal & Coke Co.	25
Lewis Tool Co.	115	National Sewing Machine Co.	Port Chester Bolt & Nut Co.	18	Smith & Hemenway Co.	111	Vitrified Emery Wheel Co.	56
Lidgerwood Mfg. Co.	142	National Specialty Mfg. Co.	Potter & Johnston Co.	75	Smith, M. B. Co.	66	Vulcan Iron Works.	46
Lillenberg, N.	80	National Tube Co.	Potts, Horace T. & Co.	29	Smooth On Mfg. Co.	69	Vulcanus Forging Co.	36
Lima Steel Castings Co.	81	National Wire Corp.	Poulter & Co.	82	Smythe, S. R. Co., Inc.	40		
Lindsay, W. W. & Co.	24	Naugatuck Mfg. Co.	Pratt Chuck Co.	60	Snell Mfg. Co.	101	W	
Link-Belt Engineering Co.	52	Nazel & Bassett.	Pratt & Whitney Co.	75	Snow, L. T.	141	Waggoner Watchman Clock Co.	9
Livermore, Homer F.	34 & 36	New Albany Mfg. Co.	Prentiss Bros. Co.	80	Snow Flake Axle Grease Co.	106	Wallace, Wm. H. & Co.	23
Lloyd Mfg. Co.	119	New Brunswick Fdry. Co.	Prentiss, Geo. W. & Co.	8	Snyder, W. P. & Co.	28	Wardlow, S. & C.	23
Lockhart Iron & Steel Co.	28	New Century Mfg. Co.	Prentiss Tool & Supply Co.	84	Sommer's Son, John.	142	Ward, Edgar T. & Sons.	83
Lodge & Shipley Mch. Tool Co.	82	New Doty Mfg. Co.	Prentiss Vise Co.	115	Southern Railway Co.	87	Warner Bros. Co.	8
Logan Iron & Steel Co.	68	New England Steel Casting Co.	Presbrey Fire Brick Co.	85	Southwark Fdry. & Mch. Co.	43	Warren City Boiler Works.	42
Logan & Strobridge Iron Co.	100	New England Structural Co.	Pugh, Job T.	101	Speldel, J. G.	48	Warren, J. D. Mfg. Co.	120
Lombart Iron Works & Supply Co.	36	New Freedom Wire Cloth Co.	Fullman, J. Wesley.	29	Spencer's, I. S. Sons.	53	Washington Coal & Coke Co.	88
Lorain Foundry Co.	82	Newhall, Henry B.	Fullman Sash Balance Co.	124	Spencer Automatic Mch. Screw Co.	142	Waterbury Brass Co.	2
Lorain Steel Co.	30	New Haven Mfg. Co.	Putnam Nail Co.	129	Spencer Wire Co.	18	Waterbury Farrel Foundry & Machine Co.	16
Louden Mch. Co.	132	New Iron & Metal Co.	Q		Spofford, W. S. & Son.	85	Waterbury Rope Co.	6
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**Brass Butts**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Brass Founders**

Clark, John W., Albany, N. Y.  
Cramp, Wm. & Sons & E. B. Co., Philadelphia, Pa.  
Reeves, Paul S., Philadelphia, Pa.  
Ryan, J. J. & Co., Chicago, Ill.

**Brass Goods**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Brass and Iron Jack Chains**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Bridge Builders**

American Bridge Co., East Berlin, Ct.  
Boston Bridge Works, Boston, Mass.  
Easter Bridge & Structural Co., Worcester, Mass.  
Illinois Steel Co., Chicago, Ill.  
New England Structural Co., Boston, Mass.  
Scaife, Wm. B. & Sons, Pittsburgh, Pa.

**Bronze, Manganese**

Cramp, Wm. & Sons & E. B. Co., Philadelphia, Pa.

**Bronze Tobin**

Ansonia Bronze & Copper Co., 99 John St., N. Y.

**Brushes and Brushes**

Osborn Mfg. Co., Cleveland, O.

**Buffing Wheels**

Divine Bros. Co., Utica, N. Y.

**Buggies**

Parry Mfg. Co., Indianapolis, Ind.

**Builders' Hardware**

Reading Hardware Co., Reading, Pa.  
Stanley Works, New Britain, Conn.  
U. S. Steel Lock Co., Clinton, Iowa.

**Buildozers**

Williams, White & Co., Moline, Ill.

**Butchers' Saws**

Diston, Henry & Sons, Inc., Phila., Pa.  
Goodell-Fratt Co., Greenfield, Mass.  
Jennings, C. E. & Co., 101 Reade St., N. Y.

**Butchers' Tools**

Chatillon, John & Sons, 85-89 Cliff St., N. Y.  
Goodell Co., Antrim, N. H.

**Butts and Hinges—See Hinges.****Buyers' System**

Folding Paper Box Co., So. Bend, Ind.

**Calibers and Dividers**

Starrett, L. S. Co., Athol, Mass.  
J. Stevens Arms & Tool Co., Chicopee Falls, Mass.

**Car Springs**

Scott, Chas. Spring Co., Phila., Pa.

**Car Wheels**

Ramapo Car Wheel Co., Ramapo, N. Y.

**Carbide of Silicon**

Carborundum Co., Niagara Falls, N. Y.

**Carborundum Grains**

Carborundum Co., Niagara Falls, N. Y.

**Carborundum Wheels**

Carborundum Co., Niagara Falls, N. Y.

**Carriage Hardware**

Atlas Bolt & Screw Co., Cleveland, O.  
Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.  
Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eckles, Richard, Auburn, N. Y.  
McKinnon Dash Co., Buffalo, N. Y.  
Scranton Forging Co., Scranton, Pa.

**Carriage and Wagon Springs**

Rowland, Wm. & Harvey, Phila., Pa.

**Cars**

Atlas Bolt & Screw Co., Cleveland, O.  
Sheffield Car Co., Three Rivers, Mich.

**Cartridges**

Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.  
Peters Cartridge Co., Cincinnati, O.

**Carving Tools**

Buck, Chas., Millbury, Mass.

**Case Hardening Material**

American Carburizing Co., Jersey City, N. J.

**Cash Recorders**

Hough Cash Recorder Co., Indian Orchard, Mass.  
Whiting Mfg. Co., Northboro, Mass.

**Castings, Atlas Metal**

Ferro-Carbon Castings Co., Phila., Pa.

**Castings, Brass, Bronze and Copper**

Bridgeport Deoxidized Bronze & Metal Co., Bridgeport, Conn.  
Chap



- New England Steel Castings Co.,** Philadelphia, Pa.  
**Otis Steel Co., Ltd.,** Cleveland, Ohio  
**Shaw, E. M.,** Providence, R. I.  
**Union Steel Casting Co.,** Pittsburgh, Pa.
- Catalogue Files**  
 Folding Paper Box Co., 88, Bend, Ind.
- Ceilings, Metal**  
 Youngtown Iron & Steel Roofing Co., Youngstown, O.
- Cements, Iron**  
 Smooth On Mfg. Co., Jersey City N. J.
- Chains**  
 Bradlee & Co., Philadelphia.  
 Bridgeport Chain Co., Bridgeport, Ct.  
 Chilcott-Evans Chain Co., Allegheny, Pa.  
 Garland Chain Co., Rankin, Pa.  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
 Jenkins Iron & Tool Co., Howard, Pa.  
 Link-Belt Engineering Co., Phila., Pa.  
 McKay Jas. & Co., Pittsburgh, Pa.  
 Nicholson & Co., Pittsburgh, Pa.  
 Onelda Community, Ltd., Niagara Falls  
 Standard Chain Co., Pittsburgh, Pa.
- Chain Plants**  
 Turner, Vaughn & Taylor Co., Cuyahoga Falls, O.
- Chemicals**  
 Elmer & Amend, New York.
- Cherry Stokers**  
 Enterprise Mfg. Co., Philadelphia, Pa.  
 Goodell Co., Antrim, N. H.
- Chisels**  
 Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.  
 Jennings, C. E. Co., 101 Reade St., N. Y.  
 White, L. & I. J. Co., Buffalo, N. Y.
- Christmas Tree Holders**  
 North Bros. Mfg. Co., Philadelphia, Pa.
- Clutches**  
 Cushman Chuck Co., Hartford, Conn.  
 Doehler Mfg. Co., Middletown, Conn.  
 Goodell Pratt Co., Greenfield, Mass.  
 Hoggson & Pettis Mfg. Co., New Haven.  
 Holland Mfg. Co., Erie, Pa.  
 Horton, E. & Son Co., Windsor Locks, Ct.  
 Ideal Machine Works, Hartford, Conn.  
 Pratt Chuck Co., Frankfort, N. Y.  
 Skinner Chuck Co., New Britain, Conn.  
 Standard Tool Co., Cleveland, O.  
 Union Mfg. Co., 108 Chambers, N. Y.  
 Whiton, D. E. Mach. Co., New London.
- Cider Mills**  
 Whit Hurst, R. W. & Co., Norfolk, Va.
- Circular Sawing Machines**  
 Kidder, R. E., Worcester, Mass.
- Clamps**  
 Beesley, C. H. & Co., Chicago, Ill.  
 Hall, Thos., Brooklyn, N. Y.  
 Hammer & Co., Branford, Conn.
- Clipping Machines**  
 Amer. Shearer Mfg. Co., Nashua, N. H.  
 Chicago Flexible Shaft Co., Chicago, Ill.  
 McCoy, Joe, F. Co., 38 Warren St., N. Y.  
 Wiebusch & Hilger, Ltd., 9-13 Murray St., N. Y.
- Clothes Dryers**  
 Hill Dryer Co., Worcester, Mass.
- Clothes Line Hook**  
 Wilson, E. H. & Co., Allston, Mass.
- Clothes Pins**  
 U. S. Clothes Pin Co., Montpelier, Vt.
- Coal**  
 Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
 Sloss Sheffield Steel & Iron Co., Birmingham, Ala.  
 Washington Coal & Coke Co., Dawson, Pa.  
 Wister, Francis, Philadelphia, Pa.
- Coal Cars**  
 Lansing Wheelbarrow Co., Lansing, Mich.
- Coal Picks**  
 Jenkins Iron & Tool Co., Howard, Pa.
- Coal Shutes**  
 Lansing Wheelbarrow Co., Lansing, Mich.
- Office and Spice Mills**  
 Arcade Mfg. Co., Freeport, Ill.  
 Parker, Chas. Co., Meriden, Conn.
- Coke**  
 Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
 Bessemer Coke Co., Pittsburgh, Pa.  
 Cherry Valley Iron Co., Pittsburgh, Pa.  
 Dimmick, J. K. & Co., Phila., Pa.  
 Frick, H. C. Coke Co., Pittsburgh, Pa.  
 Houston, C. B. & Co., Philadelphia, Pa.  
 Sloss Sheffield Steel & Iron Co., Birmingham, Ala.  
 Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.  
 Virginia Iron, Coal & Coke Co., Bristol, Va.-Tenn.  
 Washington Coal & Coke Co., Dawson, Pa.  
 Wister, Francis, Philadelphia, Pa.
- Colleges**  
 Michigan College of Mines, Houghton, Mich.
- Compressed Air Machinery**  
 Phila. Pneumatic Tool Co., Phila. Pa.
- Conductor Pipe**  
 Berger Bros. Co., Philadelphia, Pa.
- Conveying Machinery**  
 Aultman Co., Canton, Ohio.  
 Brown Hoisting & Conveying Machine Co., Cleveland, Ohio.  
 California Wire Works, San Francisco.  
 Hunt, C. W. Co., W. New Brighton, N. Y.  
 Jeffrey Mfg. Co., Columbus, O.  
 Link-Belt Engineering Co., Phila., Pa.
- Cooking Utensils**  
 Cleveland Stamping & Tool Co., Cleveland, O.
- Coping Saw**  
 Jones & Dommersnas, Chicago, Ill.
- Copper**  
 Hendricks Bros., 49 Cliff, N. Y.  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
 United Metals Selling Co., 11 Broadway, N. Y.
- Copper Hammers**  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Rail Bands**  
 American Steel & Wire Co., Chicago, Ill.
- Copper Rivets and Burrs**  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Copper Tacks and Nails**  
 Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.
- Corper Wire, Bare and Insulated**  
 American Steel & Wire Co., Chicago, Ill.
- Cordage**  
 Samson Cordage Works, Boston, Mass.  
 Silver Lake Co., Boston, Mass.
- Cordage Machinery**  
 Hoover & Gamble Co., Miamisburg, O.
- Core Ovens**  
 Millet Core Oven Co., Brightwood, Mass.
- Cork Screws and Cork Pullers**  
 Erie Specialty Co., Erie, Pa.
- Corn Hooks**  
 Withington & Cooley Mfg. Co., Jackson, Mich.
- Corn Hookers**  
 Wilcox Mfg. Co., Aurora, Ill.
- Corrugated Iron and Steel**  
 Iron & Steel Roofing Co., Cleveland, O.  
 McCullough Iron Co., Wilmington, Del.  
 Scaife, Wm. B. & Sons, Pittsburgh.
- Corker Pin Machines. Automatic**  
 Shuster, F. B. Co., New Haven, Conn.
- Cotton Ties**  
 American Steel Hoop Co., Battery Park Building, N. Y.
- Counting Machines**  
 Durant W. N. Milwaukee Wis.
- Couplings, Compression**  
 Bennett, Geo. B. Co., Youngstown, O.
- Cow Ties**  
 Garland Chain Co., Rankin, Pa.  
 Onelda Community, Ltd., Niagara Falls, O.
- Cranes**  
 Brown Hoisting & Conveying Mch. Co., Cleveland, O.  
 Chisholm & Moore Mfg. Co., Cleveland.  
 Cleveland Crane & Car Co., Cleveland, O.  
 Niles Tool Works Co., 136-138 Liberty St., N. Y.  
 Northern Engineering Works, Detroit, Mich.  
 Pawling & Harnischfeger, Milwaukee, Wis.  
 Pneumatic Crane Co., Pittsburgh, Pa.  
 Reading Crane & Hoist Wks., Reading, Pa.  
 Ridgway, Craig & Son Co., Coatesville, Pa.  
 Spedel, J. G., Reading, Pa.
- Crayon**  
 Steward, D. M. Mfg. Co., Chattanooga, Tenn.
- Crucibles**  
 Dixon, Jos. Crucible Co., Jersey City, N. J.
- Cupolas**  
 Paxson, J. W. Co., Philadelphia, Pa.
- Cupolas, Hot Blast**  
 Hyrap & Co., Detroit, Mich.
- Curry Combs**  
 New York Stamping Co., Brooklyn, N. Y.
- Cutlery**  
 Cattaraugus Cutlery Co., Little Valley, N. Y.  
 Chatillon, John & Sons, 85 to 89 Cliff St., N. Y.  
 Dams, Stoddard & Co., Boston.  
 Goodell Co., Antrim, N. H.  
 Kimball, C. J. Co., Bellington, N. H.  
 Smith & Hemenway Co., 236 Broadway, N. Y.  
 Wiebusch & Hilger, Ltd., 9 to 13 Murray St., N. Y.
- Cutting Off Machines**  
 Hurbit Rogers Mach. Co., So. Sudbury, Mass.
- Dampers**  
 Williams, A. C., Ravenna, O.
- Dashes and Fenders**  
 McKinnon Dash Co., Buffalo, N. Y.
- Diamond Tools**  
 Dickinson, Thos. L., 45 Vesey St., N. Y.
- Dies**  
 Advance Mach. Works, Brooklyn, N. Y.  
 American Hdw. Mfg. Co., Ottawa, Ill.  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Ferrante Mach. Co., Bridgeton, N. J.  
 Hay-Budden Mfg. Co., Brooklyn, N. Y.  
 Mosberg, Frank Co., Attleboro, Mass.  
 Richard Mfg. Co., Bloomsburg, Pa.  
 Wilson & Smith, Worcester, Mass.
- Door Bells.—See Bells and Gongs.**
- Door Catches**  
 Graham, John H. & Co., 113 Chambers Street, New York.
- Door Checks and Springs**  
 Bardsley, Joe, 147 151 Baxter St., N. Y.  
 Pullman Sash Balance Co., Rochester, N. Y.
- Door Holders**  
 Caldwell Mfg. Co., Rochester, N. Y.
- Draught Springs**  
 Burditt & Williams, Boston, Mass.
- Draw Benches**  
 Richard Mfg. Co., Bloomsburg, Pa.  
 Thompson, Hugh L., Waterbury, Ct.
- Drill Grinders**  
 Heald, L. S. & Son, Barre, Mass.  
 Sellers, Wm. & Co., Inc., Phila., Pa.  
 Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.  
 Wilma & Morman, Grand Rapids, Mich.
- Drilling Machines**  
 Aurora Tool Works, Aurora, Ind.  
 Barnes, R. F. Co., Rockford, Ill.  
 Bausch, W. F. & John Co., Rockford, Ill.  
 Bausch Mch. Tool Co., Springfield, Mass.  
 Bement, Miles & Co., Phila., Pa.  
 Buckford Drill & Tool Co., Cin., Ohio.  
 Bullard Machine Tool Co., Bridgeport, Ct.  
 Burnham, Geo. Co., Worcester, Mass.  
 Champion Blower & Forge Co., Lancaster, Pa.  
 Cincinnati Mch. Tool Co., Cincinnati, O.  
 Dallett, Thos. H. & Co., Philadelphia.  
 D'Amour & Littlefield Mch. Co., 131 Worth St., N. Y.  
 Davis, W. P., Machine Co., Rochester, N. Y.
- Detrick & Harvey Mch. Co.,** Baltimore, Md.
- Drees, Mueller & Co.,** Cincinnati, O.
- Fosdick & Holloway Mach. Tool Co.,** Cincinnati, O.
- Harrington, E. Son & Co.,** Phila., Pa.
- Hill, Clarke & Co.,** Boston, Mass.
- Hoefler Mfg. Co.,** Freeport, Ill.
- Prentice Bros.,** Worcester, Mass.
- Quint, A. D.,** Hartford, Conn.
- Shuster, F. B. Co.,** New Haven, Conn.
- Sibley & Ware, So. Bend, Ind.**
- Sigourney Tool Co.,** Hartford, Conn.
- Silver Mfg. Co.,** Salem, O.
- Slate Dwight Machine Co.,** Hartford, Ct.
- Stow Flexible Shaft Co.,** Phila., Pa.
- Wiley & Russell Mfg. Co.,** Greenfield, Mass.
- York, S. M. Co.,** Cleveland, O.
- Drilling Machines, Automatic**  
 Gould & Eberhardt, Newark, N. J.
- Drills, Pneumatic**  
 Chicago Pneumatic Tool Co., Chicago, Ill.
- Drive Chains**  
 Locke Steel Belt Co., Bridgeport, Conn.
- Drop Forgings**  
 Belden Machine Co., New Haven, Conn.  
 Billings & Spencer Co., Hartford, Conn.  
 Chicago Drop Forging & Fdry. Co., Kensington, Ill.  
 Clapp, E. D. Mfg. Co., Auburn, N. Y.  
 Consolidated Railway Electric Lighting & Equipment Co., 100 Broadway, N. Y.  
 Eccles, Richard, Auburn, N. Y.  
 Indianapolis Drop Forging Co., Indianapolis, Ind.  
 Keystone Drop Forge Co., Philadelphia.  
 Kilborn & Bishop Co., New Haven, Conn.  
 R. I. Tool Co., Providence, R. I.  
 Scranton Forging Co., Scranton, Pa.  
 Seward, M. & Son Co., New Haven, Ct.  
 Springfield Drop Forging Co., Springfield, Mass.  
 Strieby & Foote Co., Newark, N. J.  
 Trause & Williams Co., Alliance, O.  
 Williams, J. H. & Co., Brooklyn, N. Y.  
 Wyman & Gordon, Worcester, Mass.
- Drop Hammers**  
 Billings & Spencer Co., Hartford, Conn.  
 Williams, White & Co., Moline, Ill.
- Drop Presses**  
 Manville, E. J. Mch. Co., Waterbury, Ct.  
 Miner & Peck Mfg. Co., New Haven, Ct.  
 Mosberg & Granville Mfg. Co., Providence, R. I.  
 Vulcan Iron Works, Chicago, Ill.
- Dumb Waiters**  
 Energy Elevator Co., Philadelphia, Pa.  
 Spedel, J. G., Reading, Pa.  
 Storm Mfg. Co., Newark, N. J.  
 Variety Machine Co., Warsaw, N. Y.
- Dump Cars**  
 Atlas Bolt & Screw Co., Cleveland, O.
- Dynamas**  
 Eddy Electric Mfg. Co., Windsor, Conn.  
 General Electric Co., Schenectady, N. Y.  
 Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Eave Trough Hangers**  
 Berger Bros. Co., Philadelphia, Pa.  
 Oatman Bros., Medina, O.
- Edge Tools**  
 Buck, Chas., Millbury, Mass.  
 Buck Bros., Millbury, Mass.  
 Ferro-Carbon Castings Co., Phila. Pa.  
 White, L. & I. J. Co., Buffalo, N. Y.
- Egg Beaters**  
 Lyon, Nelson, Albany, N. Y.  
 Standard Co., Boston, Mass.
- Egg Opener**  
 Hartigan, W. R., Collinsville, Ct.
- Electric Bells and Supplies**  
 Ostrander, W. R. & Co., 304 Fulton St.
- Electric Controllers**  
 Electric Controller & Supply Co., Cleveland, O.
- Electric Lighting and Power Apparatus**  
 Eddy Electric Mfg. Co., Windsor, Conn.  
 General Electric Co., Schenectady, N. Y.
- Electrical Apparatus**  
 Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.
- Electrotypes**  
 St. Louis Electrotypes Foundry, St. Louis, Mo.
- Elevators. Makers of**  
 Eastern Machinery Co., New Haven, Ct.  
 Energy Elevator Co., Philadelphia, Pa.  
 Link-Belt Engineering Co., Phila., Pa.  
 Morse, Williams & Co., Phila., Pa.  
 Ridgway, Craig & Son Co., Coatesville, Pa.  
 Spedel, J. G., Reading, Pa.  
 Variety Machine Co., Warsaw, N. Y.
- Elevator Buckets**  
 Clark, W. J. & Co., Salem, O.  
 Cleveland Elevator Bucket Co., Cleveland, O.
- Elevator Enclosures and Cabs**  
 Ludlow Saylor Wire Co., St. Louis, Mo.
- Emery**  
 Tanite Co., Stroudsburg, Pa.
- Emery Wheels**  
 American Emery Wheel Works, Providence, R. I.  
 Best, L., 45 Vesey St., N. Y.  
 Bridgeport Safety Emery Wheel Co., Bridgeport, Conn.  
 Buffalo Emery Wheel Co., Buffalo, N. Y.  
 Diamond Mach. Co., Providence, R. I.  
 Naze & Bassett, Phila., Pa.  
 Northampton Emery Wheel Co., Leeds, Mass.  
 Norton Emery Wheel Co., Worcester, Mass.
- Safety Emery Wheel Co.,** Springfield, O.
- Springfield Mfg. Co.,** Bridgeport, Conn.
- Star Corundum Wheel Co.,** Detroit.
- Sterling Emery Wheel Co.,** Timm, O.
- Tanite Co.,** Stroudsburg, Pa.
- Vitrified Emery Wheel Co.,** Westfield, Mass.
- Emery Wheel Dresser**  
 Chicago Screw Co., Chicago, Ill.  
 Dickinson, Thos. L., 45 Vesey St., N. Y.
- Engineers and Contractors**  
 Aiken, Henry, Pittsburgh, Pa.  
 Erikson, Edw. E., Pittsburgh, Pa.  
 Filer & Stowell Co., Milwaukee, Wis.  
 Foster-Miller Engineering Co., Pittsburgh, Pa.  
 Heil & Patterson, Pittsburgh, Pa.  
 Huber, S. V. Co., Pittsburgh, Pa.  
 Kay, G. Ashton, 238 Broadway, N. Y.  
 Kennedy, Julian, Pittsburgh, Pa.  
 Kennedy, Walter, Pittsburgh, Pa.  
 Lamond, David, Pittsburgh, Pa.  
 Laughlin, Alex. & Co., Pittsburgh, Pa.  
 McClure, G. W. Son & Co., Pittsburgh, Pa.  
 Morgan Construction Co., Worcester, Mass.  
 Penna. Engineering Wks., New Castle, Penna.  
 Ritter-Conley Mfg. Co., Pittsburgh, Pa.  
 Smythe, S. R. Co., Inc., Pittsburgh, Pa.  
 Swindell, W. & Bros., Pittsburgh, Pa.  
 Thompson, Hugh L., Waterbury, Ct.  
 Wellman Seaver Engineering Co., Cleveland, O.
- Engines**  
 Gas.  
 Metz, Aug., 138-139 Mott St., N. Y.  
 Northern Engineering Works, Detroit, Mich.  
 Woolley Fdry. & Mch. Works, Anderson, Ind.  
 Gasoline.  
 Charter Gas Engine Co., Sterling, Ill.  
 Weber Gas & Gasoline Engine Co., Kansas City, Mo.  
 Watkins, F. M., Cincinnati, O.  
 Woolley Fdry. & Mch. Works, Anderson, Ind.  
 Kerosene.  
 Metz, Aug., 138-139 Mott St., N. Y.  
 Steam.  
 Allen, E. P. Co., Milwaukee, Wis.  
 Boston Flower Co., Hyde Park, Mass.  
 Buffalo Blower Co., Buffalo, N. Y.  
 Filer & Stowell Co., Milwaukee, Wis.  
 Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.  
 Sennett Geo. B. Co., Youngstown, O.  
 Southward Fdry. & Mch. Co., Philadelphia, Pa.  
 Sturtevant, B. F. Co., Boston, Mass.  
 Tod, William & Co., Youngstown, O.  
 Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
 Wetherill, Robt. & Co., Chester, Pa.
- Engines, Marine**  
 Lake City Engineering Co., Erie, Pa.
- Engines, Second Hand**  
 Everett, B. M., Pittsburgh, Pa.
- Engravers**  
 Muford A., Hartford, Conn.
- Expanding Mandrels**  
 LeCount, Wm. G., So. Norwalk, Conn.
- Expansion Belts**  
 Church, Isaac Toledo, O.  
 McCabe Hanger Mfg. Co., 333-543 W. 23d St., N. Y.  
 Newhall Henry B. Co., N. Y.  
 Seaman D. & Co., Philadelphia, Pa.  
 Steward & Komaine Mfg. Co., Phila., Pa.
- Farmers' Tools**  
 Heller Bros. & Co., Newark, N. J.
- Faucets**  
 McKenna Brass Co., Ltd., Pittsburgh, Pa.
- Faucets, Wooden**  
 Boston & Lockport Block Co., Boston.  
 Sommer's, John, Son, Newark, N. J.
- Feed Cutters**  
 Silver Mfg. Co., Salem, O.
- Feed Water Heaters and Purifiers**  
 Harrison Safety Boiler Works, Philadelphia, Pa.  
 Kelly, B. F. & Son, 91 Liberty St., N. Y.  
 National Pipe Bending Co., New Haven.  
 Patterson, F. L., 136 Liberty St., N. Y.  
 Taunton Locomotive Mfg. Co., Taunton, Mass.  
 Webster, Warren & Co., Camden, N. J.  
 Whitlock Oil Pipe Co., Hartford, Ct.
- Fencing, Iron and Wire**  
 Adam, W. J., Joliet, Ill.  
 American Steel & Wire Co., Chicago, Ill.  
 Barnum K. T., Detroit, Mich.  
 Clinton Wire Cloth Co., Clinton, Mass.  
 DeKalb Fence Co., DeKalb, Ill.  
 Dwigins Wire Fence Co., Anderson, Ind.  
 Ellis & Halfenberger, Indianapolis, Ind.  
 Frost Wire Fence Co., Cleveland, O.  
 Gilbert & Bennett Mfg. Co., 43 Cliff St.  
 Hartman Mfg. Co., 89 Broadway, N. Y.  
 Kilmer Wire Mfg. Co., Chicago, Ill.  
 Kokomo Fence Mch. Co., Kokomo, Ind.  
 Ludlow Saylor Wire Co., St. Louis, Mo.  
 Ornamental Iron & Wire Co., Chattanooga, Tenn.  
 Rossman Woven Wire Fence Co., Rossman, N. J.  
 Stewart Iron Works, Cincinnati, Ohio.  
 Up-to-date Mfg. Co., Terre Haute, Ind.
- Ferro-Chromium**  
 Wilson Aluminum Co., 99 Cedar Street, N. Y.
- Files and Rasps**  
 Manufacturers of  
 Arcade File Works, Anderson, Ind.  
 Barnett, G. & H. Co., 41 & 43 Richmond Phila.  
 Diaston, Henry & Sons, Inc., Phila., Pa.  
 Heller Bros. Co., Newark, N. J.  
 McCaffrey File Co., Philadelphia.  
 Nicholson File Co., Providence, R. I.  
 Stokes Bros. Mfg. Co., Freehold, N. J.
- Filters**  
 Scaife, Wm. B. & Sons, Pittsburgh, Pa.

**Finished Castings**

Franklin, H. H. Mfg. Co., Syracuse, N. Y.

**Fire Brick**

Borgner, Cyrus, Philadelphia, Pa.  
Gardner Bros., Cumberland, Md.  
Haws, W. H. Fire Brick Co., Mt. Union, N. Y.  
Naurer, H. & Son, 430 E. 23d, N. Y.  
Ostrander Fire Brick Co., Troy, N. Y.  
Poinier & Lester, Toledo, O.  
Presbrey Fire Brick Co., Taunton, Mass.  
Staten Island Clay Co., Woodbridge, Taylor's, Chas. Sons Co., Cincinnati.  
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

**Fishing Tackle**

Dame, Stoddard & Co., Boston, Mass.

**Flexible Shafting**

Chicago Flexible Shaft Co., Chicago, Ill.  
Stow Flexible Shaft Co., Phila., Pa.  
Stow Mfg. Co., Binghamton, N. Y.

**Flint and Emery Paper**

Bader, Adamson & Co., Phila., Pa.

**Floor and Ceiling Plates**

Coding Mfg. Co., Bristol, Conn.

**Flue Cleaners**

Jackson Flue Scraper Co., Jackson, N. Y.

**Flue Killers**

Bigelow, J. F., Worcester, Mass.  
Montgomery, R. R. & Co., Decatur, Ill.

**Foot Power Emery Wheels**

Buffalo Emery Wheel Co., Buffalo, N. Y.

**Foot Pumps**

Gleason-Peters Air Pump Co., Houston, Tex.

**Foot Rests**

Star Heel Plate Co., Newark, N. J.

**Forges, Portable, &c.**

Bradley Co., Syracuse, N. Y.

Champion Blower & Forge Co., Lancaster, Pa.

Fairbanks Co., 311 Broadway, N. Y.

Sturtevant, B. F. Co., Boston, Mass.

**Forgings, Iron and Steel**

Baker, Jas. H. Mfg. Co., Pittsburgh, Pa.

Bethlehem Steel Co., S. Bethlehem, Pa.

Eastern Forge Co., Boston, Mass.

Frankford Steel Co., Phila., Pa.

Hay-Budden Mfg. Co., Brooklyn, N. Y.

Olds Steel Co., Ltd., Cleveland, Ohio.

Pittsburgh Shear, Knife & Machine Co., Pittsburgh, Pa.

Titusville Forge Co., Titusville, Pa.

U. S. Projectile Co., Brooklyn, N. Y.

Vulcanus Forging Co., Cleveland, O.

**Forks, Hay and Manure**

Continental Tool Co., Frankfort, N. Y.

Iowa Farming Tool Co., Ft. Madison, Ia.

Withington & Cooley Mfg. Co., Jackson, N. Y.

**Foundry Facings**

Obermayer, S. Co., Cincinnati, O.

**Foundry Lamps**

Forest City Fdy. & Mfg. Co., Cleveland, Pa.

Paxson, J. W. Co., Phila., Pa.

**Foundry Supplies**

Gilmour, J., Bennett Building, N. Y.

Obermayer, S. Co., Cincinnati, Ohio.

Osborn Mfg. Co., Cleveland, O.

Paxson, J. W. Co., Phila., Pa.

Poinier & Lester, Toledo, O.

**Friction Clutches**

Eastern Machinery Co., New Haven, Ct.

**Furnaces, Foundry**

Biram & Co., Detroit, Mich.

**Furnaces, Oil, Gas and Coal**

Rockwell Engineering Co., 26 Cortlandt St., N. Y.

**Fuses**

Ensign Bickford & Co., Simsbury, Ct.

**Gages**

Crosby Steam Gage & Valve Co., Boston.

**Galvanized Ware**

Keen & Hagerty Mfg. Co., Baltimore.

**Galvanizing**

Blackman & Klag, 601 Greenwich St., N. Y.

Empire Pipe Reading & Supply Co., Brooklyn, N. Y.

**Galvanizing Process**

U. S. Electro Galvanizing Co., 348 Broadway, N. Y.

**Garden Rakes**

Jenkins Iron & Tool Co., Howard, Pa.

**Garden Tools**

Withington & Cooley Mfg. Co., Jackson, N. Y.

**Gas Compositometer**

Lehning, Steinbart & Co., Ltd., Carlstadt, N. J.

**Gas Compressors**

Norwalk Iron Works Co., So. Norwalk, Conn.

**Gas Furnaces**

Am. Gas Furnace Co., 30 John St., N. Y.

Chicago Flexible Shaft Co., Chicago, Ill.

**Gaskets**

Candfield, H. O., Bridgeport, Conn.

**Gaskets, Iron**

Smith On Mfg. Co., Jersey City, N. J.

**Gas Producers**

Duff Patents Co., Allegheny, Pa.

Smythe, S. R. Co., Inc., Pittsburgh, Pa.

Swindell, W. & Bro., Pittsburgh, Pa.

**Gauges, Rolling Mill**

Haines Gauge Co., Philadelphia, Pa.

**Gears**

Boston Gear Works, Boston, Mass.

Cresson, Geo. V. Co., Philadelphia, Pa.

Gleason Tool Co., Rochester, N. Y.

Morse, Williams & Co., Phila., Pa.

Nuttall, R. D. Co., Pittsburgh, Pa.

Proctor, Robt. Son & Co., Baltimore, Md.

**Gears, Rawhide**

Horsburgh & Scott, Cleveland, Ohio.

**Gear Cutters**

Becker Branding Milling Machine Co., Hyde Park, Mass.

Gould & Eberhardt, Newark, N. J.

Whitton, D. E. Mch. Co., New London, Conn.

**Generators, Electric**

W. attingham Elec. & Mfg. Co., Pittsburgh, Pa.

**Gimlets**

No ton Mfg. Co., Chester, Conn.

**Glass Cutters**

Barrett, W. L., Bristol, Conn.

Boltman, F. H. & Co., Cleveland, O.  
Monce, S. G., Unionville, Conn.  
Smith & Hemenway Co., 296 Broadway, N. Y.

**Glass Cutting Boards**

Lufkin Rule Co., Saginaw, Mich.

**Glue**

Baeder, Adamson & Co., Phila., Pa.

**Golf Goods**

Bridgeport Gun Implement Co., 312 Broadway, N. Y.

**Grates, Rocking**

Sennett, Geo. B. Co., Youngstown, O.

**Grease, Axle**

Snow Flake Axle Grease Co., Boston.

**Grinding and Polishing Mchs.**

American Emery Wheel Works, Providence, R. I.

Barnes, W. F. & John Co., Rockford, Ill.

Bealy, Chas. H. & Co., Chicago, Ill.

Brown & Sharpe Mfg. Co., Providence, Cincinnati.

Cincinnati Milling Mach. Co., Cincinnati, O.

Diamond Mach. Co., Providence, R. I.

Landis Tool Co., Waynesboro, Pa.

Northampton Emery Wheel Co., Leeds, Mass.

Norton Emery Wheel Co., Worcester, Mass.

Safety Emery Wheel Co., Springfield, O.

Springfield Mfg. Co., Bridgeport, Conn.

Star Corundum Wheel Co., Detroit, Mich.

Tanite Co., Stroudsburg, Pa.

Universal Mach. Co., Providence, R. I.

Wilmarth & Morgan, Grand Rapids, Mich.

**Grindstones**

Cleveland Stone Co., Cleveland, O.

**Grabbing Machine**

New Century Mfg. Co., 43 E. 8th St., N. Y.

**Guns**

Harrington & Richardson Arms Co., Worcester, Mass.

Marlin Fire Arms Co., New Haven, Ct.

Remington Arms Co., 315 Broadway, New York.

**Gymnasium Apparatus**

Narragansett Mch. Co., Providence, R. I.

**Hack Saws**

Disston, Henry & Sons, Inc., Phila., Pa.

Goodell-Pratt Co., Greenfield, Mass.

Springfield Machine Screw Co., Springfield, Mass.

Starrett, L. S. Co., Athol, Mass.

**Hack Saw Frames**

Millers Falls Co., 23 Warren St., N. Y.

**Hammer Mold**

Field, C. H., Providence, R. I.

**Hammers**

Heller Bros. Co., Newark, N. J.

Logan & Strobbridge Iron Co., New Brighton, Pa.

**Hammers, Pneumatic**

Chicago Pneumatic Tool Co., Chicago.

**Hammocks**

Palmer, I. E., Middletown, Conn.

Bicknell Hdw. Co., Janesville, Wis.

**Hand Screws**

Bliss, R. Mfg. Co., Pawtucket, R. I.

**Handle Machinery**

Defiance Machine Works, Defiance, O.

**Hangers, Barn Door**

Coleman Hardware Co., Chicago, Ill.

**Hangers, Door**

Chicago Spring Butt Co., Chicago, Ill.

Cornett Trolley Track Mfg. Co., Holyoke, Mass.

Cronk Hanger Co., Elmira, N. Y.

Lane Bros., Poughkeepsie, N. Y.

Lawrence Bros., Sterling, Ill.

Louden Machinery Co., Fairfield, Iowa.

McCabe Hanger Mfg. Co., 533-543 W. 22d St., N. Y.

McKinney Mfg. Co., Allegheny, Pa.

Ney Mfg. Co., Canton, Ohio.

Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

Wilcox Mfg. Co., Aurora, Ill.

**Hangers, Shafting**

Ball Bearing Co., Boston, Mass.

Dodge Mfg. Co., Milwaukee, Ind.

**Hardware Comm'n Merchants**

Graham, Jno. H. & Co., 113 Chambers St., N. Y.

Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Hardware Manufacturers**

Arcade Mfg. Co., Freeport, Ill.

Central Hardware Co., Phila.

Coleman Hardware Co., Chicago, Ill.

Logan & Strobbridge Iron Co., New Brighton, Pa.

Millers Falls Co., 23 Warren St., N. Y.

Ney Mfg. Co., Canton, Ohio.

Nicol & Co., Chicago, Ill.

Parker, Chas. Co., Meriden, Conn.

Peck, Stow & Wilcox Co., 27 Murray St., N. Y.

Stanley Works, New Britain, Conn.

Union Mfg. Co., 103 Chambers St., N. Y.

Van Wagoner & Williams Hdw. Co., Cleveland, O.

Wrightsville Hdw. Co., Wrightsville, Pa.

**Hardware Mfrs.' Agents**

Graham, John H. & Co., 113 Chambers St., N. Y.

Wiebusch & Hilger, Ltd., 9-15 Murray St., N. Y.

**Hardware Shelving**

Warren, J. D. Mfg. Co., Chicago, Ill.

**Hardware Specialties**

Acme Shear Co., Bridgeport, Conn.

Berger Bros. Co., Philadelphia, Pa.

Enterprise Mfg. Co., of Pa., Phila., Pa.

Graham, John H. & Co., 113 Chambers St., N. Y.

Pleuger & Henger Mfg. Co., St. Louis.

Scranton & Co., The, New Haven, Ct.

Smith & Egge Mfg. Co., Bridgeport, Ct.

Smith & Hemenway Co., 296 Broadway, N. Y.

**Harness Snaps**

Coverly Mfg. Co., West Troy, N. Y.

Coverly Saddlery Wks., Farmer, N. Y.

Imperial Bit & Snap Co., Racine, Wis.

**Haps and Staples**

McKinney Mfg. Co., Allegheny, Pa.

**Hatchets**

Jenkins Iron & Tool Co., Howard, Pa.

**Hay Knives**

Clark & Parsons Co., E. Wilton, Me.

Ney Mfg. Co., Canton, Ohio.

**Hay Tools**

Louden Machinery Co., Fairfield, Iowa.

Myers, F. E. & Bro., Ashland, O.

Ney Mfg. Co., Canton, O.

**Heating and Ventilating Apparatus**

American Blower Co., Detroit, Mich.

Bayley, Wm. & Sons Co., Milwaukee, Wis.

Boston Blower Co., Hyde Park, Mass.

Buffalo Forge Co., Buffalo, N. Y.

Perkins, B. F. & Son, Holyoke, Mass.

Sturtevant, B. F. Co., Boston, Mass.

**Heel Plates**

Star Heel Plate Co., Newark, N. J.

**Hinges**

Jenkins Iron & Tool Co., Howard, Pa.

Lawrence Bros., Sterling, Ill.

McKinney Mfg. Co., Allegheny, Pa.

Stanley Works, New Britain, Conn.

Tiebout, W. & J., 118 Chambers St., N. Y.

**Hitching Posts**

Hartman Mfg. Co., 309 Broadway, N. Y.

**Hoes, Garden, Planters', &c.**

Continental Tool Co., Frankfort, N. Y.

Iowa Farming Tool Co., Fort Madison.

Jenkins Iron & Tool Co., Howard, Pa.

**Holists, Air**

Pedrick & Ayer Co., Philadelphia, Pa.

Ridgway, Craig & Son Co., Coatesville, Pa.

**Holists, Chain and Rope**

Box, Alfred & Co., Philadelphia, Pa.

Ekstein, C. G., 249 Centre St., N. Y.

Fulton Iron & Engine Works, Detroit, Mich.

Harrington, E. Son & Co., Phila., Pa.

McCoy, Jos. F. & Co., 26 Warren St.

Reading Crane & Hoist Works, Reading, Pa.



**Lockers**  
Narragansett Mch. Co., Providence, R.I.

**Locks and Knobs**  
Central Hardware Co., Phila., Pa.  
Reading Hdw. Co., Reading, Pa.  
U. S. Steel Lock Co., Clinton, Iowa.

**Locomotives**  
Everson, B. M., Pittsburgh, Pa.

**Lumbering Tools**  
Gerlach, Peter & Co., Cleveland, Ohio.

**Lubricants**  
Dixon, Jos., Crucible Co., Jersey City  
Snow Flake Axle Grease Co., Boston.

**Lumbering Tools**  
Morley Bros., Saginaw, Mich.

**Lunch Boxes**  
Seavey Mfg. Co., Boston, Mass.

**Machinery**  
Acme Machinery Co., Cleveland, Ohio.  
Ajax Mfg. Co., Cleveland, Ohio.  
American Tool Wks. Co., Cincinnati, O.  
Bairstow, W. & Co., Pittsburgh, Pa.  
Barnes, W. F. & Co., Rockford, Ill.  
Bausch Mch. Tool Co., Springfield, Mass.  
Becker-Brinard Milling Mach. Co., Hyde Park, Mass.  
Bliss E. W. Co., Brooklyn, N.Y.  
Bowler, Geo. H., Cleveland, O.  
Bridges, Marvin, 12 Broadway, N. Y.  
Brown & Sharpe Mfg. Co., Providence.  
Bullard Mch. Tool Co., Bridgeport, Ct.  
Carlin Machinery & Supply Co., Allegheny, Pa.  
Carlin's Sons, Thos., Allegheny, Pa.  
Chesley Machinery Co., Havemeyer Bldg., N. Y.  
Cincinnati Milling Mach. Co., Cincinnati, O.  
Cincinnati Planer Co., Cincinnati, Ohio.  
Cornell, J. B. & J. M., 26th St. and 11th Ave., New York City.  
Davis, W. P. Machine Co., Rochester, N. Y.  
Dawson, A. L. & Co., Chicago, Ill.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Diamond Drill & Mch. Co., Birdsboro, Pa.  
Down, J. B. & Co., Chicago, Ill.  
Draper Mach. Tool Co., Worcester, Mass.  
Farrel Fdry & Mch. Co., Ansonia, Conn.  
Ferracuti Machine Co., Bridgeport, N. J.  
Fish, H. C. Machine Works, Worcester, Mass.  
Garvin Machine Co., Spring and Varick Sts., N. Y.  
General Supply Co., 40 John St., N. Y.  
Geometric Drill Co., Westville, Conn.  
Gray, Ibbot, J., 52-54 E. 132d St., N. Y.  
Hannan & Pinton, Springfield, Mass.  
Harris Mach. Co., Minneapolis, Minn.  
Hendey Machine Co., Torrington, Conn.  
Hill, Henry F., Boston, Mass.  
Hill, Clarke & Co., Boston, Mass.  
Johnson, Israel H., Jr., & Co., Phila.  
Johnson, Wm. C. & Sons Mch. Co., St. Louis, Mo.  
Kaiser, A. V. & Co., Phila., Pa.  
Keagy & Lear Mch. Co., Cohocton, O.  
Lodge & Shipley Mch. Tool Co., Cin., O.  
Lund, S. T., Boston, Mass.  
McCabe, J. J., 14 Day Street, N. Y.  
McDowell & Co., Pittsburgh, Pa.  
McDowell Stocker & Co., Chicago.  
Manning, Maxwell & Moore, 35-39 Liberty St., N. Y.  
Manville, J. J. Mach. Co., Waterbury, Ct.  
Marshall & Huchart Mch. Co., Chicago, Ill.  
Mossberg, Frank Co., Attleboro, Mass.  
National Machinery Co., Tiffin, Ohio.  
New Doty Mfg. Co., Janesville, Wis.  
New Haven Mch. Co., New Haven, Conn.  
New York Machinery Depot, 178 Broadway, New York.  
Niles Tool Works Co., 138 Liberty St., N. Y.  
Nilson, A. H. Mch. Co., Bridgeport, Ct.  
Paradox Machinery Co., Chicago, Ill.  
Pennsylvania Machinery Co., Phila., Pa.  
Phila. Machine Tool Co., Phila., Pa.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.  
Pond Machine Tool Co., Plainfield, N.J.  
Poole, Robt. & Son Co., Baltimore, Md.  
Potter & Johnston Co., Pawtucket, R. I.  
Poulter & Co., Phila., Pa.  
Pruitt & Whitney Co., Hartford, Conn.  
Prentiss Bros., Worcester, Mass.  
Prentiss Tool & Supply Co., 115 Liberty St., N. Y.  
Rainer & Williams, Chicago, Ill.  
Reade, Wm. A. & Co., Cleveland, O.  
Seyfert's Sons, L. F., Philadelphia, Pa.  
Sourgrain Tool Co., Hartford, Conn.  
Thomas & Lowe Machinery Co., Providence, R. I.  
Toomey, Frank, Philadelphia, Pa.  
Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.  
Wetherill Robert & Co., Chester, Pa.  
Windsor Machine Co., Windsor, Vt.  
Wisconsin Machinery Co., Milwaukee, Wis.  
Wormer, C. C. Mch. Co., Detroit, Mich.  
York, S. M. Co., Cleveland, O.

**Machinery, Wood Working**  
DeLance Machine Wks., DeLance, O.  
Fay, J. A. & Egan Co., Cincinnati, O.

**Machinery Springs**  
Scott, Chas. Spring Co., Phila., Pa.

**Machinery Builders**  
Chapman, J. B. & Co., Springfield, Mass.  
U. S. Projectile Co., Brooklyn, N. Y.

**Machine Knives**  
Lloyd, John Co., 558-562 Water St., N. Y.

**Machine Screws—See Screws, Machine**

**Machine Screw Work**  
Spencer Automatic Mch. Screw Co., Hartford, Conn.

**Machine Tools—See Machinery**

**Machine Work**  
Nuttall, R. D. Co., Pittsburgh, Pa.

**Machine Wrenches**  
Billings & Spencer Co., Hartford, Conn.

**Machinists' Scales**  
Starrett, L. S. Co., Boston, Mass.

**Machinists' Tools and Supplies**  
Billings & Spencer Co., Hartford, Conn.  
General Supply Co., 40 John St., N. Y.  
Keystone Mfg. Co., Buffalo, N. Y.  
King, J. M. & Co., Waterford, N. Y.

**Manganese Bronze**  
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Manufacturing Properties**  
Hillman, J. H. & Co., Pittsburgh, Pa.

**Manufacturing Sites**  
Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.

Southern Railway Co., Washington, D. C.

**Measuring Machines**  
Rogers, Jno. M. Bow, Gauge & Drill Wks., Gloucester City, N. J.

**Meat Choppers**  
Brown, J. M., 160 Duane St., N. Y.  
Enterprise Mfg. Co. of Pa., Phila., Pa.  
Peck, Stow & Wilcox Co., 27 Murray St., New York.  
Streeter, N. R. & Co., Rochester, N. Y.  
Woodruff, O. D., Pottstown, Pa.

**Metal Brokers**  
American Metal Co., 52 Broadway, N. Y.

**Metals**  
Hendricks Bros., 49 Cliff St., N. Y.  
Hofeler, Theo. & Co., Buffalo, N. Y.  
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.  
Rutter, A. T., 256 Broadway, N. Y.  
United Metals Selling Co., 11 Broadway, N. Y.

**Metal Polish**  
Hoffman, Geo. W., Indianapolis, Ind.

**Metal Spinning**  
Goodwin & Kintz Co., Winsted, Conn.

**Milling Machines**  
Aashua (C.), Dubuque, Iowa.  
Becker-Brinard Milling Machine Co., Hyde Park, Mass.  
Brown & Sharpe Mfg. Co., Providence.  
Carter & Hakes Mach. Co., Winsted, Ct.  
Cincinnati Milling Mach. Co., Cin., O.  
Fox Machine Co., Grand Rapids, Mich.  
Garvin Machine Co., Spring and Varick Sts., N. Y.  
Niles Tool Works Co., 138-139 Liberty St., N. Y.  
Shuster, F. B. Co., New Haven, Conn.  
Thurston Mfg. Co., Providence, R. I.

**Mining Knives**  
Bishop, Geo. H. & Co., Cincinnati, O.  
Palmer Hdw. Mfg. Co., Troy, N. Y.

**Mining Machinery**  
Allis, E. P. Co., Milwaukee, Wis.  
Rand Drill Co., 100 Broadway, N. Y.

**Mining Screens**  
Harrison & King Perforating Co., Chicago, Ill.  
Howard & Morse, 45 Fulton St., N. Y.  
Michigan Wire Cloth Co., Detroit, Mich.

**Miter Boxes**  
Thomson Bros. & Co., Lowell, Mass.

**Model Makers**  
Star Mfg. Co., New Haven, Conn.

**Molding Machines**  
Adams, C., Dubuque, Iowa.  
Maywood Fdry. & Mch. Co., Chicago.

**Motor Fans**  
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Motors, Air**  
Stow Flexible Shaft Co., Phila., Pa.

**Motors, Electric**  
Eddy Electric Mfg. Co., Windsor, Conn.  
General Electric Co., Schenectady, N.Y.  
Sturtevant, B. F. Co., Boston, Mass.  
Westinghouse Elec. & Mfg. Co., Pittsburgh, Pa.

**Nail Clippers**  
Cook, H. C. Co., Ansonia, Conn.

**Nail Machinery**  
Crescent Mfg. Co., Belleville, Ill.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.

**Nail Pullers**  
Bridgeport Mfg. Co., Bridgeport, Conn.  
Hazen & Field, Troy, N. Y.  
Scranton & Co., The, New Haven, Conn.  
Snow, L. T., New Haven, Conn.

**Name Plates, Machinery**  
Livermore, Homer F., Boston, Mass.  
Murdoch Parlor Gate Co., Boston, Mass.

**Natural Gas Pumps**  
Norwalk Iron Wks. Co., So. Norwalk, Ct.

**Nickel Platers' Supplies**  
Eddy Electric Mfg. Co., Windsor, Conn.

**Nickeloid**  
American Nickeloid Co., Peru, Ill.

**Norway Shapes**  
Rowland, William & Harvey, Frankford, Philadelphia.

**Nuts—See Bolts**

**Nuts, Self-Locking**  
National Elastic Nut Co., Milwaukee, Wis.

**Nut Machines**  
Dunham Nut Co., Unionville, Conn.

**Oil Burners**  
Burns Hydro-Carbon Burner Co., Fort Plain, N. Y.

**Oil Burning Appliances**  
Rockwell Engineering Co., 26 Cortlandt St., N. Y.

**Oil Extractor**  
Reed & Curtis Mch. Screw Co., Worcester, Mass.

**Oil Heaters—See Oil Stoves**

**Oil Stones**  
Pike Mfg. Co., Pike Station, N. H.

**Oil Stoves—(See Stoves Oil, Vapor and Gasoline)**

**Oilers**  
Stern Mfg. Co., Pittsburgh, Pa.  
Hammer & Co., Branford, Conn.  
Stoutenburg Mfg. Co., Keltsburg, Ill.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Oilless Bearings**  
North American Metalline Co., Long Island City, N. Y.

**Ore Breakers**  
Aultman Co., Canton, O.  
Cresson, Geo. V. Co., Phila., Pa.

**Ores**  
Blair, Reed F. Co., Pittsburgh, Pa.  
Samuel, Frank, Philadelphia, Pa.  
Wieter, Francis, Philadelphia, Pa.

**Ox Shoes**  
Scranton Forging Co., Scranton, Pa.  
Woodruff, Walter W. & Sons, Mt. Carmel, Conn.

**Packing**  
Boston Belting Co., Boston, Mass.  
Morrison, Robert, St. Louis, Mo.  
Peerless Rubber Mfg. Co., 16 Warren Street, N. Y.

**Packing, Iron**  
Smooth On Mfg. Co., Jersey City, N. J.

**Paints**  
Dixon, Jos. Crucible Co., Jersey City.

**Pants Stretcher**  
Covert Mfg. Co., West Troy, N. Y.

**Patent Solicitors**  
Goepel & Baegener, 280 Broadway, N. Y.  
Hamlin, Geo. R., Washington, D. C.  
Howson & Howson, Philadelphia and Washington.  
Stocking, E. B., Washington, D. C.

**Patterns**  
Norwalk Pattern & Mfg. Co., So. Norwalk, Conn.

**Perforated Metal**  
Clinton Wire Cloth Co., Clinton, Mass.  
Harrington & King Perforating Co., Chicago, Ill.  
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.

**Phosphor Bronze**  
Hungerford, U. T. Brass & Copper Co., 121 Worth St., N. Y.  
Phosphor Bronze Smelting Co., Limited, Philadelphia.

**Phosphor Tin**  
Crescent Phosphorized Metal Co., Philadelphia, Pa.  
Halk & Naumann, 518 Pearl St., N. Y.

**Picture Wire**  
Ossawa Mills Co., Norwich, Conn.

**Pig Casting Machines**  
Heyl & Patterson, Pittsburgh, Pa.

**Pig Iron**  
Alabama Consolidated Coal & Iron Co., Birmingham, Ala.  
Ashland Steel Co., Ashland, Ky.  
Bairstow, W. F. & Co., Phila., Pa.  
Cherry Valley Iron Co., Pittsburgh, Pa.  
Dimmick, J. K. & Co., Phila., Pa.  
Hickman, Williams & Co., Chicago, Ill.  
Houston, C. B. & Co., Philadelphia, Pa.  
Nicol, B. & Co., 59-61 Will St., N. Y.  
Samuel, Frank, Philadelphia, Pa.  
Slone-Sheffield Steel & Iron Co., Birmingham, Ala.  
Snyder, W. P. & Co., Pittsburgh, Pa.  
Superior Charcoal Iron Co., Grand Rapids, Mich.  
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.  
Tidewater Steel Co., Phila., Pa.  
Virginia Iron, Coal and Coke Co., Bristol, Va.—Tenn.

**Pig Iron Analysis**  
Church, S. R., San Francisco, Cal.

**Pig Iron Storage**  
Am. Pig Iron Storage Warehouse Co., 4 Wall St., N. Y.

**Pig Lead**  
Penna. Smelting Co., Pittsburgh, Pa.

**Pile Drivers**  
Vulcan Iron Works, Chicago, Ill.

**Pipe, Bent**  
National Pipe Bending Co., New Haven, Conn.  
National Tube Co., Pittsburgh, Pa.  
Whitlock Coil Pipe Co., Hartford, Ct.

**Pipe Coupling**  
Williams, J. H. & Co., Brooklyn, N. Y.

**Pipe Cutter**  
Hanton, M. C., 103 Chambers St., N. Y.

**Pipe Cutting and Threading Machines**  
Armstrong Mfg. Co., Bridgeport, Conn.  
Bignall & Keeler Mfg. Co., Edwardsville, Ill.  
Curtis & Curtis, Bridgeport, Conn.  
Jarecki Mfg. Co., Erie, Pa.  
Merrill Mfg. Co., Toledo, O.  
Saunders' Sons, D., Yonkers, N. Y.

**Pipe Grips**  
Prentiss Vise Co., 44 Barclay, N. Y.

**Pipes, Fittings, &c.**  
Jarecki Mfg. Co., Erie, Pa.  
McNab & Harlin Mfg. Co., N. Y.

**Pipe, Riveted Steel**  
Pollock, W. R. Co., Youngstown, O.  
Scaife, Wm. B. & Sons, Pittsburgh.

**Pipe, Water and Gas**  
Millar, C. & Son Co., Utica, N. Y.  
National Tube Co., Pittsburgh, Pa.  
Red Jacket Mfg. Co., Davenport, Iowa.  
U. S. Cast Iron Pipe & Foundry Co., Phila., Pa.  
Warren City Boiler Works, Warren, O.  
Wood, R. D. & Co., Philadelphia, Pa.

**Piston Rods, Tobia Bronze**  
Ansonia Brass & Copper Co., 99 John St., N. Y.

**Planes**  
Stanley Rule & Level Co., N. Y.

**Planers**  
Amer. Tool Works Co., Cincinnati, O.  
Bairstow, W. F. & Co., Pittsburgh, Pa.  
Cincinnati Planer Co., Cincinnati, O.  
Detrick & Harvey Mch. Co., Baltimore.  
Draper Mch. Tool Co., Worcester, Mass.  
Pond Machine Tool Co., Plainfield, N.J.  
Whitcomb Mfg. Co., Worcester, Mass.  
Wilson, W. A., Rochester, N. Y.

**Plated Ware**  
International Silver Co., Meriden, Ct.

**Plates, Iron and Steel**  
Jones & Laughlin, Ltd., Pittsburgh, Pa.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Singer, Nimick & Co., Inc., Pittsburgh, Pa.  
Tidewater Steel Co., Phila., Pa.  
Wood, Alan Co., Philadelphia.

**Plate Iron Work**  
Scaife, Wm. B. & Sons, Pittsburgh.

**Pliers**  
Bridgeport Mfg. Co., Bridgeport, Conn.  
Cronk Hanger Co., Elmira, N. Y.  
Utica Drop Forge & Tool Co., Utica, N. Y.

**Pneumatic Tools**  
Chicago Pneumatic Tool Co., Chicago.  
Phila. Pneumatic Tool Co., Phila., Pa.

**Pocket Knives**  
Cattaraugus Cutlery Co., Little Valley, N. Y.

**Polishing Wheels**  
Divine Bros. Co., Utica, N. Y.

**Portable Track**  
Atlas Bolt & Screw Co., Cleveland, O.

**Poultry Fencing**  
DeKalb Fence Co., DeKalb, Ill.

**Poultry Nettings**  
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
N. J. Wire Cloth Co., Trenton, N. J.  
Tyler, W. S. Co., Cleveland, O.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Power Hack Saws**  
Hoefer Mfg. Co., Freeport, Ill.

**Power Hammers**  
Beaudry & Co., Boston, Mass.  
Bradley Co., Syracuse, N. Y.  
Dieneit & Eisenhardt, Philadelphia.  
Dupont Mfg. Co., St. Johnsbury, Vt.  
Kidder, R. E., Worcester, Mass.  
Miner & Peck Mfg. Co., New Haven, Ct.  
Scranton & Co., The, New Haven, Conn.

**Power Transmitting Mach'y**  
Cresson, Geo. V. Co., Phila., Pa.  
Dodge Mfg. Co., Mishawaka, Ind.  
Norwalk Iron Wks. Co., So. Norwalk, Ct.

**Pressed Metal Work**  
Avery Stamping Co., Cleveland, Ohio.

**Presses, Power**  
Adriance Mach. Works, Brooklyn, N.Y.  
Hiles, E. W. Co., Brooklyn, N. Y.  
Cross & Spela Mch. Co., Waterbury, Ct.  
Ferracuti Mach. Co., Bridgeport, N. J.  
Hibbard, W. H., Brooklyn, N. Y.  
Hilles & Jones Co., Wilmington, Del.  
Keagy & Lear Mch. Co., Cohocton, O.  
Lefter, Chas. & Co., Brooklyn, N. Y.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Mossberg & Granville Mfg. Co., Providence, R. I.  
Niagara Machine & Tool Wks., Buffalo.  
Perkins Machine Co., Boston, Mass.  
Phila. Machine Tool Co., Phila., Pa.  
Rudolph & Krummel, Chicago, Ill.  
Shuster, F. B. Co., New Haven, Conn.

**Projectiles**  
National Tube Co., Pittsburgh, Pa.

**Pruning Shears**  
Cronk Hanger Co., Elmira, N. Y.

**Pulleys**  
Amer. Pulley Co., Phila., Pa.  
Dodge Mfg. Co., Mishawaka, Ind.  
Eastern Machinery Co., New Haven, Ct.  
Evans, G. F., Boston, Mass.  
Foster Pulley Works, Rochester, N.Y.  
Hess, Snyder & Co., Massillon, O.  
Jones & Laughlin, Ltd., Pittsburgh, Pa.  
Saginaw Mfg. Co., Saginaw, Mich.  
Woods, T. B. Sons, Chambersburg, Pa.

**Pumping Machinery**  
Cook, A. D., Lawrenceburg, Ind.  
Flier & Stowell Co., Milwaukee, Wis.  
Ingersoll-Sergeant Drill Co., 36 Cortlandt St., N. Y.  
Lake City Engineering Co., Erie, Pa.  
McGowan, J. H. & Co., Cincinnati, O.  
Southwark Fdry. & Mch. Co., Philadelphia, Pa.

**Pumps**  
Athol Pump Co., Athol, Mass.  
Barnes Mfg. Co., Mansfield, O.  
Deming Co., Salem, O.  
Edson Mfg. Co., Boston, Mass.  
Flint & Walling Co., Kendaerville, Ind.  
Hess, Snyder & Co., Massillon, O.  
Humphreys Mfg. Co., Mansfield, O.  
Myers, F. E. & Bro., Ashland, Ohio.  
Red Jacket Mfg. Co., Davenport, Ia.  
St. Joseph Pump & Mfg. Co., St. Joseph, Mo.  
Wilder, S. & Co., Holliston, Mass.

**Punches, Conductors'**  
Woodman, R. Mfg. & Supply Co., Boston, Mass.

**Punches and Shears, Hand and Power**  
Bethlehem Foundry & Machine Co., So. Bethlehem, Pa.  
Bicknell Hdw. Co., Janesville, Wis.  
Hiles, E. W. Co., Brooklyn, N. Y.  
Hilles & Jones Co., Wilmington, Del.  
Mersick, C. S. & Co., New Haven, Conn.  
New Doty Mfg. Co., Janesville, Wis.  
Williams, White & Co., Moline, Ill.

**Punching and Shearing**  
Harrington & King Perforating Co., Chicago, Ill.

**Push Carts**  
Syracuse Chilled Plow Co., Syracuse.

**Pyrometers**  
Uehling, Steinbart & Co., Ltd., Carlsbad, N. J.

**Railways, Industrial**  
Hunt, C. W. Co., West New Brighton, N. Y.

**Rat and Mouse Traps**  
Burditt & Williams, Boston, Mass.

**Ratchet Drills**  
Keystone Mfg. Co., Buffalo, N. Y.

**Rawhide Gears**  
Nazel & Bassett, Philadelphia, Pa.

**Razors**  
Buck Bros., Millbury, Mass.

**Razor Hones**  
Pike Mfg. Co., Pike Station, N. H.

**Reamers**  
Morse Twist Drill & Mch. Co., New Bedford, Mass.

**Recording Gauges**  
Bristol Co., Waterbury, Conn.  
Behling, Steinbart & Co., Ltd., Carlstadt, N. J.

**Reels**  
Hendryx, A. B. Co., New Haven, Conn.

**Refrigerating Machinery**  
York Mfg. Co., York, Pa.

**Refrigerators**  
Maine Mfg. Co., Nashua, N. H.

**Registers**  
Stowell Mfg. & Foundry Co., So. Milwaukee, Wis.

**Relaying Rails**  
Donaldson & Newton, Phila., Pa.  
Isaac Joseph Iron Co., Cincinnati, O.  
May & Spalding, 32 Broadway, N. Y.  
Steel Rail Supply Co., 100 E. 4th St., N. Y.

**Reloading Tools**  
Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
Ideal Mfg. Co., New Haven, Conn.

**Repairing Sets, Family**  
Mitchell, W. B. Chicago, Ill.  
Schuyler, M. Sons & Co., Chicago, Ill.  
Star Steel Plate Co., Newark, N. J.

**Repair Outfits, Farmers'**  
Imperial Bit & Snap Co., Racine, Wis.

**Revolution Counters**  
Pitkin, A. B. Machinery Co., Providence.  
Taber Mfg. Co., Elizabeth, N. J.

**Revolvers**  
Harrington & Richardson Arms Co., Worcester, Mass.  
Johnson, Iver, Arms & Cycle Works, Fitchburg, Mass.

**Rheostats**  
Electric Controller & Supply Co., Cleveland, O.

**Rifles**  
Marlin Fire Arms Co., New Haven, Ct.  
Remington Arms Co., 315 E. 4th St., N. Y.  
Stevens Arms & Tool Co., Chicopee Falls, Mass.

**Ring Rollers**  
Shuster, F. B. Co., New Haven, Conn.

**Riveters**  
Phila. Pneumatic Tool Co., Phila., Pa.

**Riveters, Pneumatic**  
Chicago Pneumatic Tool Co., Chicago.

**Rivets**  
American Iron & Steel Mfg. Co., Lebanon, Pa.  
American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.  
Burden Iron Co., Troy, N. Y.  
Clark & Cowles, Plainville, Conn.  
Cobb & Drew, Plymouth, Mass.  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.  
McLanahan, C. E. & Co., Phila., Pa.  
Plymouth Mills, Plymouth, Mass.  
Rockford Bolt Works, Rockford, Ill.  
Townsend C. C. & E. F., New Brighton, Pa.

**Riveting Machines**  
Bethlehem Foundry & Mch. Co., So. Bethlehem, Pa.  
Shuster, F. B. Co., New Haven, Conn.

**Roll Mill Machinery**  
Bradcock Machine & Mfg. Co., Brad-dock, Pa.  
Morgan Construction Co., Worcester, Mass.

**Roll Turning Tools**  
Tretlow, Sam'l & Co., Ltd., Pittsburgh

**Roller Bearings**  
Ball Bearing Co., Boston, Mass.  
Mossberg & Granville Mfg. Co., Providence, R. I.

**Rolling Mill Machinery**  
Booth, The Lloyd Co., Youngstown, O.  
Everson, B. M., Pittsburgh, Pa.  
Farrell Fdry. & Mch. Co., Ansonia, Ct.  
Frank-Kneeland Mach. Co., Pittsburgh.  
Garrison, A. Foundry Co., Pittsburgh.  
Mesta Machine Co., Pittsburgh, Pa.  
Morgan Construction Co., Worcester, Mass.  
Mossberg & Granville Mfg. Co., Providence, R. I.  
Penna. Engineering Wks., New Castle, Penna.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.

**Rolls, Chilled, Sand and Steel**  
Booth, The Lloyd Co., Youngstown, O.  
Farrell Fdry. & Mch. Co., Ansonia, Ct.  
Frank-Kneeland Mach. Co., Pittsburgh.  
Garrison, A. Fdry. Co., Pittsburgh, Pa.  
Lorain Foundry Co., Lorain, Ohio.  
Mesta Machine Co., Pittsburgh, Pa.  
Phila. Roll & Mch. Co., Philadelphia, Pa.  
Seaman, Sleeth Co., Pittsburgh.  
Totten & Hogg Iron and Steel Fdry. Co., Pittsburgh, Pa.  
Youngstown Foundry & Machine Co., Youngstown, O.

**Roofing and Siding**  
Asphalt ready roofing Co., 136 Water St., N. Y.  
Garry Iron & Steel Roofing Co., Cleveland, O.  
Scaife, Wm. B. & Sons, Pittsburgh.  
Youngstown Iron & Steel Roofing Co., Youngstown, O.

**Rope and Cordage**  
American Mfg. Co., 65 Wall St., N. Y.  
Waterbury Rope Co., 89 South St., N. Y.

**Rope and Web Goods**  
Covert Mfg. Co., West Troy, N. Y.

**Rope Shield**  
Ironides Co., Columbus, Ohio.

**Rope Transmission and Hoisting**  
American Mfg. Co., 65 Wall St., N. Y.  
California Wire Works, San Francisco, Cal.  
Hunt, C. W. Co., West New Brighton, N. Y.  
Leschen, A. & Sons, Rope Co., St. Louis.  
Woods, F. B. Sons, Chambersburg, Pa.

**Rubber Goods**  
Boston Belting Co., Boston, Mass.  
Canfield, H. O. Bridgeport, Conn.  
Peerless Rubber Mfg. Co., 10 Warren Street, N. Y.

**Rules**  
Askin Rule Co., Saginaw, Mich.

Stanley Rule & Level Co., 29 Chambers St., N. Y.

**Sad Irons**  
Williams, A. C., Ravenna, O.

**Sand Blast Apparatus**  
Ward, Edgar T. & Sons, Boston, Mass.

**Sand Paper**  
Baeder, Adamson & Co., Phila., Pa.

**Sash Balances**  
Caldwell Mfg. Co., Rochester, N. Y.  
Pullman Sash Balance Co., Rochester, N. Y.  
Streeter, N. R. & Co., Rochester, N. Y.

**Sash Cords and Chains**  
Bridgeport Chain Co., Bridgeport, Conn.  
Morton, Thos., 65 Elizabeth St., N. Y.  
Samson Cordage Works, Boston, Mass.  
Silver Lake Co., Boston, Mass.  
Smith & Egge Mfg. Co., Bridgeport.

**Sash Locks**  
Fitch, W. & E. T. Co., The, New Haven, Conn.  
Ives, H. B. & Co., New Haven, Conn.  
Oehnger, J. L., Chicago, Ill.

**Sash Pulleys**  
Fox Machine Co., Grand Rapids, Mich.  
Grand Rapids Hardware Co., Grand Rapids, Mich.  
Palmer Hardware Mfg. Co., Troy, N. Y.

**Sash Weights**  
Barney & Reed Mfg. Co., Boston, Mass.  
Brown, E. E. & Co., Philadelphia, Pa.

**Sausage Stuffers**  
National Specialty Mfg. Co., Phila., Pa.

**Saws**  
Atkins, E. C. & Co., Indianapolis, Ind.  
Bishop, Geo. H. & Co., Cincinnati, Ohio.  
Disston, Henry & Sons, Inc., Phila., Pa.  
National Saw Co., Newark, N. J.  
Simonds Mfg. Co., Fitchburg, Mass.

**Saw Clamps**  
Disston, Henry & Sons, Inc., Phila., Pa.

**Saw Guides**  
Thomson Bros. & Co., Lowell, Mass.

**Saw Handles**  
Ladd, W. C., Bristol, Conn.

**Saw Sets**  
Disston, Henry & Sons, Inc., Phila., Pa.  
Taintor Mfg. Co., 9 to 15 Murray, N. Y.

**Saw Tools**  
Atkins, E. C. & Co., Indianapolis, Ind.

**Scales**  
Chaffin, John & Sons, 85-89 Cliff, N. Y.  
Chicago Scale Co., Chicago, Ill.  
Fennell Scale & Mfg. Co., Chicago, Ill.  
Reading Hardware Co., Reading, Pa.  
Standard Scale & Supply Co., Pittsburgh.

**Scrap Metals**  
Armstrong, R. S. & Bro., Atlanta, Ga.  
Blake, M. J. & M., 10th Ave. and 13th St., N. Y.  
Botcher, C., Hoboken, N. J.  
Greiner, F., Philadelphia, Pa.  
Hinter, H. A. & Sons, Phila., Pa.  
Hoteller, Theo. & Co., Buffalo, N. Y.  
Leonard, John & Co., 22 Broadway, N. Y.  
Miles, E. O. & Co., Atlanta, Ga.  
N. J. Iron & Metal Co., Paterson, N. J.  
Perry, Wm. H. Co., Providence, R. I.  
Phillips, E. R. & Sons Co., Phila., Pa.  
Ritter, W. H., Bridgeport, Conn.  
Samuels, M. Sons, Brooklyn, N. Y.  
Smith Morton B. Co., New York.

**Scrap Metal Breakers**  
Birdsboro Iron & Steel Breaking Co., Birdsboro, Pa.

**Scrapers, Road**  
American Steel Scraper Co., Sidney, O.  
Aultman Co., Canton, Ohio.  
Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.  
Snyder Steel Scraper Co., Sidney, O.  
Syracuse Chilled Plow Co., Syracuse, N. Y.

**Screen Hanger**  
Winter, H. G., Minneapolis, Minn.

**Screens, Perforated Metal**  
Harrington & King Perforating Co., Chicago, Ill.

**Screens, Window and Door**  
Darcy, Edw. & Sons, Philadelphia, Pa.

**Screw Cutting Dies**  
Card, S. W. Mfg. Co., Mansfield, Mass.  
Geometric Drill Co., Westfield, Mass.  
Rogers, Jno. M. Boat Gauge & Drill Wks., Gloucester City, N. J.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.  
Winter Bros., Wrentham, Mass.

**Screw Drivers**  
Brown, R. H. & Co., New Haven, Conn.  
Goodell-Pratt Co., Greenfield, Mass.  
Mayhew, H. H. Co., Shelburne Falls, Mass.  
North Bros. Mfg. Co., Philadelphia, Pa.  
Sawyer Tool Co., Fitchburg, Mass.  
Union Mfg. Co., Buffalo, N. Y.

**Screw Machine Products**  
Dodge Machine Screw Co., Boston, Mass.

**Screw Machinery**  
American Tool Wks. Co., Cincinnati, O.  
Brown & Sharpe Mfg. Co., Providence.  
Draper Mach. Tool Co., Worcester, Mass.  
Garvin Machine Co., Springfield and Varick Sts., N. Y.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Windsor Mch. Co., Windsor, Vt.

**Screws**  
Hall's Sam'l Sons, 229 West 10th St., N. Y.  
Haskell, Wm. H. Mfg. Co., Pawtucket, R. I.

**Screws, Machine**  
American Screw Co., Providence, R. I.  
Blake & Johnson, Waterbury, Conn.  
Chicago Screw Co., Chicago, Ill.  
Haskell, Wm. H. Mfg. Co., Pawtucket.  
Hubbell, Harvey, Bridgeport, Conn.  
Illinois Screw Co., Chicago, Ill.  
Miles, F. S., 305 Quarry, Philadelphia.  
Nagarscrew Co., Buffalo, N. Y.  
Phila. Mach. Screw Works, Phila., Pa.  
Pittsburgh Screw & Bolt Co., Pittsburgh, Pa.  
Reed & Curtis Mch. Screw Co., Worcester, Mass.  
Rhode Island Tool Co., Providence, R. I.  
Worcester Mch. Screw Co., Worcester.

**Wood**  
American Screw Co., Providence, R. I.  
Franklin Moore Co., Winsted, Conn.  
Reading Screw Co., Norristown, Pa.

**Scroll Saws**  
Barnes, W. F. & John Co., Rockford, Ill.  
Millers Falls Co., 28 Warren St., N. Y.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Seythe Stones and Whetstones**  
Cleveland Stone Co., Cleveland, O.  
Pike Mfg. Co., Pike Station, N. H.

**Seamless Steel Tubes**  
Ivins Ellwood, 487 Broadway, N. Y.  
Janney, Steinmetz & Co., Phila., Pa.  
National Tube Co., Pittsburgh, Pa.

**Sewing Machines**  
National Sewing Machine Co., Belvidere, Ill.

**Shaft Coupling**  
Nicholson, W. H. & Co., Wilkes-Barre, Pa.  
Fairbanks Co., 311 Broadway, N. Y.

**Shafting**  
American Steel & Wire Co., Chicago, Ill.  
Cresson, Geo. V. Co., Philadelphia, Pa.  
Dodge Mfg. Co., Mishawaka, Ind.  
Fairmount Mch. Co., Philadelphia, Pa.  
Finished Steel Co., Youngstown, O.  
Jones & Laughlins Co., Pittsburgh, Pa.  
Pardee C. & Sons, Perth Amboy, N. J.  
Pittsburgh Steel Shafting Co., Rankin, Pa.  
Stow Mfg. Co., Binghamton, N. Y.  
Woods, T. B. Sons, Chambersburg, Pa.

**Shaped Iron and Steel**  
Allentown Rolling Mill, Allentown, Pa.  
American Steel Hoop Co., Battery Park Building, N. Y.  
Forest City Steel & Iron Co., Cleveland, Ohio.  
Lindsay, W. W. & Co., Phila., Pa.  
Lockhart Iron & Steel Co., Pittsburgh, Pa.  
National Steel Co., Bridgeport, O.  
Passaic Rolling Mill Co., Paterson, N. J.  
Phoenix Iron Co., Phila., Pa.  
Pittsburgh Steel Shafting Co., Rankin, Pa.  
Republic Iron & Steel Co., Chicago, Ill.

**Shapers**  
Barker-Chard Mach. Tool Co., Cincinnati, O.  
Gould & Eberhardt, Newark, N. J.  
Perkins Machine Co., Boston, Mass.  
Potter & Johnston Co., Pawtucket, R. I.

**Shear Knives**  
Pittsburgh Shear, Knife & Machine Co., Pittsburgh, Pa.  
Tretlow, Sam'l & Co., Ltd., Pittsburgh

**Shears and Scissors**  
Acme Shear Co., Bridgeport, Conn.  
Cattaraugus Cutlery Co., Little Valley, N. Y.  
Heinrich's, R. Sons Co., Newark, N. J.  
Lang Cutlery Works, Cedar Rapids, Ia.  
National Cutlery Co., Phila., Pa.  
Weinbach & Hilger, Ltd., 9-15 Murray St., N. Y.

**Shears, Metal**  
Carlin's, Thomas Sons Co., Allegheny, Pa.

**Sheet Bars**  
National Steel Co., Battery Park Building, N. Y.

**Sheet and Bolt Copper**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Sheet and Rolled Brass**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Sheet Metal Machinery**  
Adriance Mach. Works, Brooklyn, N. Y.

**Sheets, Galvanized**  
American Sheet Steel Co., New York.  
McCullough Iron Co., Wilmington, Del.

**Sheets, Iron and Steel**  
American Sheet Steel Co., New York.  
McCullough Iron Co., Wilmington, Del.  
National Steel Co., Bridgeport, O.  
Republic Iron & Steel Co., Chicago, Ill.  
Singer, Nimick & Co., Inc., Pittsburgh.  
Wister, L. & R. Co., Philadelphia, Pa.  
Alan Wood Co., Philadelphia.

**Sheet Zinc**  
Illinois Zinc Co., Peru, Ill.  
Mathlessen & Hegeler Zinc Co., La Salle, Ill.

**Shelf Boxes**  
Heiler Box Co., Montclair, N. J.  
Moore, C. P., Ravenswood, W. Va.

**Shelf Ladders**  
Bicycle Step Ladder Co., Chicago, Ill.  
Cowan Trolley Track Mfg. Co., Holyoke, Mass.  
Milbradt, G. A. & Co., St. Louis, Mo.  
Morley Bros., Saginaw, Mich.

**Shelving**  
Warren, J. D. Mfg. Co., Chicago, Ill.

**Shipbuilders**  
Newport News Shipbuilding & Dry Dock Co., 1 Broadway, N. Y.

**Shovels, Spades and Scoops**  
St. Louis Shovel Co., St. Louis, Mo.

**Slings**  
Kilbourne & Jacobs Mfg. Co., Columbus, O.

**Skates, Ice**  
Dane, Stoddard & Co., Boston, Mass.  
Union Hardware Co., Torrington, Conn.

**Skate Sharpeners**  
Osborn Mfg. Co., Cleveland, O.

**Skylights**  
Drouve, G. Co., Bridgeport, Conn.

**Smelting Works**  
Reeves, Paul S., 760 S. Broad, Phila.

**Soapstone Goods**  
Pike Mfg. Co., Pike Station, N. H.

**Soapstone Pencils**  
Steward, D. M. Mfg. Co., Chattanooga, Tenn.

**Soldering Copper Handles**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Soldering Coppers**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Speaking Tubes**  
Ostrander, W. R. & Co., 304 Fulton St., N. Y.

**Specialty Manufacturers**  
Franklin, H. H. Mfg. Co., Syracuse, N. Y.  
Smith & Egge Mfg. Co., Bridgeport, Ct.

**Spelter**  
Illinois Zinc Co., Peru, Ill.  
Mathlessen & Hegeler Zinc Co., La Salle, Ill.  
Penna. Smelting Co., Pittsburgh, Pa.

**Spelter Solder**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Spikes**  
American Iron & Steel Mfg. Co., Lebanon, Pa.

**Spoons and Forks**  
International Silver Co., Meriden, Ct.

**Sporting Goods**  
Dane, Stoddard & Co., Boston, Mass.

**Spray Pumps—(See Pumps)**

**Springs**  
American Steel & Wire Co., Chicago, Ill.  
Barnes, Wallace Co., Bristol, Conn.  
Cary Spring Works, 240 W. 29th St., N. Y.  
Chaffin, John & Sons, 85-89 Cliff St., New York.  
Clark & Cowles, Plainville, Conn.  
Dunbar Bros., Bristol, Conn.  
Miller & Van Winkle, Brooklyn, N. Y.  
Morgan Spring Co., Worcester, Mass.  
Sabin Machine Co., Montpelier, Vt.  
Scott, Chas. Spring Co., Phila., Pa.  
St. Johns Spring Co., St. Johns, Mich.  
Weich, T. F. Mfg. Co., Boston, Mass.

**Springs, Wagon, Etc.**  
Wurster, F. W. & Co., Brooklyn, N. Y.

**Spring Cotters**  
Brooks, M. S. & Sons, Chester, Conn.  
Holinger Fence Co., Greenville, O.

**Spring Hinges**  
Botmer Bros., Brooklyn, N. Y.  
Chicago Spring Butt Co., Chicago, Ill.  
Coleman Hdw. Co., Chicago, Ill.  
Van Wagoner & Williams Hdw. Co., Cleveland, O.

**Sprocket Chain**  
Buhl Malleable Co., Detroit, Mich.

**Spruce Cutters, Foot and Power**  
Shuster, F. B. Co., New Haven, Conn.

**Stacks**  
Scaife, Wm. B. & Sons, Pittsburgh.

**Stamped Ware**  
Jenkinson, R. C. & Co., Newark, N. J.  
Keen & Hagerty, Mfg. Co., Baltimore.  
New York Stamping Co., Brooklyn, N. Y.

**Stamping, Sheet Metal**  
American Hdw. Mfg. Co., Ottawa, Ill.  
American Railway Supply Co., 24 Park Place, N. Y.  
American Steel Scraper Co., Sidney, O.  
Cleveland Stamping & Tool Co., Cleveland, Ohio.  
Davis & Buxton Stamping Co., Worcester, Mass.  
Goodwin & Kintz Co., Winsted, Conn.  
Houghton & Buxton Mfg. Co., Worcester, Mass.  
Jenkinson, R. C. & Co., Newark, N. J.  
Kingslow, E. & Bro., Cleveland, Ohio.  
McKenna Brass Co., Ltd., Pittsburgh, Pa.  
Mossberg, Frank Co., Attleboro, Mass.  
Reed & Curtis Mch. Screw Co., Worcester, Mass.  
Wheeling Hinge Co., Wheeling, W. Va.  
Wilson & Smith, Worcester, Mass.

**Staple Machines, Automatic**  
Shuster, F. B. Co., New Haven, Conn.

**Staples and Double Pointed Tacks**  
Grand Crossing Tack Co., Grand Crossing, Ill.  
Milwaukee Tack Co., Milwaukee, Wis.  
Titchener, E. H. & Co., Binghamton, N. Y.

**Steam Hammers, &c.**  
Blenett & Eberhardt, Philadelphia.  
Dudgeon, Richard, 24 Columbia St., N. Y.  
Sellers, Wm. & Co., Inc., Phila., Pa.

**Steam Heating**  
Wester, Warren & Co., Camden, N. J.

**Steam Separators**  
Harrison Safety Boiler Wks., Phila., Pa.  
Wester, Warren & Co., Camden.

**Steam Shovels**  
Thew Automatic Shovel Co., Lorain, O.

**Steam Specialties**  
Crosby Steam Gage & Valve Co., Boston.  
Mason Regulator Co., Boston, Mass.

**Steel Balls**  
Cleveland Ball & Screw Co., Cleveland.

**Steel Buildings**  
American Bridge Co., East Berlin, Ct.  
Boston Bridge Works, Boston, Mass.  
New England Structural Co., Boston, Mass.  
Ritter-Conley Mfg. Co., Pittsburgh, Pa.  
Scaife, Wm. B. & Sons, Pittsburgh, Pa.

**Steel, Cold Rolled Strip**  
Wilmot & Hobbs Mfg. Co., Bridgeport.  
Wolf, R. H. & Co., Ltd., 11th Street and Harlem River, N. Y.

**Steel Forgings and Castings**  
Bethlehem Steel Co., So. Bethlehem, Pa.

**Steel Hoops**  
American Steel Hoop Co., Battery Park Building, N. Y.

**Steel Importers**  
Hobson, Houghton & Co., 98 John St., N. Y.  
Jesse, Wm. & Sons, Sheffield, England, or 21 John St., N. Y.  
Milne, A. & Co., 1 Broadway, N. Y.  
Wheelock, Lovejoy & Co., New York and Boston.

**Steel (Mushet's) Special**  
Jones, B. M. & Co., Boston.

**Steel Manufacturers**  
American Steel Hoop Co., Battery Park Building, N. Y.  
Ashland Steel Co., Ashland, Ky.  
Baker, Hermann & Co., 108 Duane St., New York.  
Braeburn Steel Co., Braeburn, Pa.  
Champion Iron & Steel Co., Muskegon, Mich.  
Chester Steel Castings Co., Phila., Pa.  
Chrome Steel Works, Brooklyn, N. Y.  
Crescent Steel Co., Pittsburgh, Pa.



**Frankford Steel Co., Philadelphia.**  
Hobson, Houghton & Co., 96 John St., N. Y.

**Jessop, Wm. & Sons, Sheffield, England,**  
or 81 John St., New York.

**Jones & Laughlins, Ltd., Pittsburgh, Pa.**  
Kidd Bros. & Hatcher Steel Wire Co., McKees Rocks, Pa.

**La Belle Steel Co., Pittsburgh, Pa.**  
Lorain Steel Co., Lorain, Ohio.

**Lukens Iron & Steel Co., Coatesville, Pa.**  
Nash, Geo. & Co., Chicago.

**National Steel Co., Battery Park Building,**  
N. Y.

**Newkirk, J. B. & Co., Philadelphia, Pa.**  
Otis Steel Co., Ltd., Cleveland, Ohio.

**Republic Iron & Steel Co., Chicago, Ill.**  
Rowland, Wm. & Harvey, Frankford, Philadelphia.

**Singer, Nimick & Co., Inc., Pittsburgh.**  
Tidewater Steel Co., Phila., Pa.

**Wardlaw, S. & C., Sheffield, England.**  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Manufacturers' Agents**  
Ogden & Wallace, 377-383 Greenwich St., New York.

**Snyder, W. P. & Co., Pittsburgh, Pa.**  
Tennessee Coal, Iron & R. R. Co., Birmingham, Ala.

**Virginia Iron, Coal and Coke Co., Bristol,**  
Va.—Tenn.

**Steel, Self Hardening**  
Denman & Davis, 85-87 John St., N. Y.

**Steel Rails**  
Lorain Steel Co., Lorain, Ohio.

**Steel Stamps and Stencil Dies**  
Buckler, L. A. Stamp Wks., Little Ferry, N. J.

**Ness, Geo. M., Jr., 61 Fulton St., N. Y.**  
Schwerdtle & Siebert, Bridgeport, Conn.

**Steel, Tool**  
Braeburn Steel Co., Braeburn, Pa.

**Creascent Steel Co., Pittsburgh, Pa.**  
Denman & Davis, 85-87 John St., N. Y.

**Frankford Steel Co., Philadelphia, Pa.**  
Jessop, Wm. & Sons, Sheffield, England,

**81 John St., N. Y.**  
Jones, B. M. & Co., Boston, Mass.

**La Belle Steel Co., Pittsburgh, Pa.**  
Nash, Geo. & Co., Chicago.

**Singer, Nimick & Co., Pittsburgh, Pa.**

**Steel Ladders, Rolling**  
Bicycle Step Ladder Co., Chicago, Ill.

**Coburn Trolley Track Mfg. Co., Holyoke,**  
Mass.

**Milbradt, G. A. & Co., St. Louis, Mo.**  
Morley Bros., Saginaw, Mich.

**Stamps and Dies**  
Armstrong Mfg. Co., Bridgeport, Conn.

**Card, S. W. Mfg. Co., Mansfield, Mass.**  
Currie & Currie, Bridgeport, Conn.

**Fairbanks Co., 311 Broadway, N. Y.**  
Hollands Mfg. Co., Erie, Pa.

**Jones & Lamson Mch. Co., Springfield,**  
Vt.

**Jarecki Mfg. Co., Erie, Pa.**  
Saunders' Sons, D., Wrentham, N. Y.

**Wells Bros. & Co., Greenfield, Mass.**  
Wiley & Russell Mfg. Co., Greenfield, Mass.

**Winter Bros., Wrentham, Mass.**

**Stone Cutting Machinery**  
Gilmour, J., Bennett Bldg., N. Y.

**Stone Working Machinery**  
Patch, F. R. Mfg. Co., Rutland, Vt.

**Stop Screws**  
Read, A. P. & Co., Chicago, Ill.

**Store Fixtures**  
Warren, J. M. Mfg. Co., Chicago, Ill.

**Stern Sash Hanger**  
Winter, K. G., Minneapolis, Minn.

**Stern Window Fasteners**  
Woodruff, W. W. & Sons, Mt. Carmel, Ct.

**Stove Linings**  
Ostrander Fire Brick Co., Troy, N. Y.

**Stove Pipe Thimbles**  
Cheney, S. & Son, Manlius, N. Y.

**Stoves, Oil, Vapor and Gasoline**  
Schneider & Trenkamp Co., Cleveland, Ohio.

**Straightening Machines, Wire and Sheet Metal**  
Shuster, F. B. Co., New Haven, Conn.

**Structural Iron and Steel Work**  
American Bridge Co., East Berlin, Ct.

**Boston Bridge Works, Boston, Mass.**  
Eastern Bridge & Structural Co., Worcester, Mass.

**Forest City Steel & Iron Co., Cleveland,**  
Ohio.

**Illinois Steel Co., Chicago, Ill.**  
Mosley Iron Bridge & Roof Co., 39 Cortland St., N. Y.

**New England Structural Co., Boston,**  
Mass.

**Phoenix Iron Co., Philadelphia, Pa.**  
Ritter-Conley Mfg. Co., Pittsburgh, Pa.

**Stewart Iron Works, Cincinnati, Ohio.**  
West Side Foundry Co., Troy, N. Y.

**Sulphuric Acid**  
Mathieson & Legler Zinc Co., La Salle, Ill.

**Swaging Machines**  
Excelsior Needle Co., Torrington, Ct.

**Table Ware**  
International Silver Co., Meriden, Ct.

**Tacks, Brads, &c.**  
Diamond Tack & Nail Works, Raynham, Mass.

**Grand Crossing Tack Co., Grand Cross,**  
Ing, Ill.

**Milwaukee Tack Co., Milwaukee, Wis.**  
Plymouth Mills, Plymouth, Mass.

**Ripley & Bartlett, Plymouth, Mass.**  
Shelton Co., Birmingham, Conn.

**Tack and Nail Machinery**  
Kimball Bros. & Sprague, Brockton, Mass.

**Sweetser, W. A., Brockton, Mass.**

**Tanks, Iron and Steel**  
Manogue-Pidgeon Iron Co., Memphis, Tenn.

**Scaife, Wm. R. & Sons, Pittsburgh.**

**Tapes**  
Luffin Rule Co., Saginaw, Mich.

**Tap Holder**  
Ideal Machine Works, Hartford, Conn.

**Tapping Machines**  
Hubbell, Harvey, Bridgeport, Conn.

**Taps and Dies**  
Bailey, C. H. & Co., Chicago, Ill.

**Butlerfield & Co., Derby Line, Vt.**  
Card, S. W. Mfg. Co., Mansfield, Mass.

**Reece, E. F. Co., Greenfield, Mass.**  
Wells Bros. & Co., Greenfield, Mass.

**Wiley & Russell Mfg. Co., Greenfield,**  
Winter Bros., Wrentham, Mass.

**Telephones**  
Rawson Electric Co., Elvira, Ohio.

**Terne Plate**  
American Tin Plate Co., N. Y.

**Thimble Skins**  
Mitchell, W. B., Chicago, Ill.

**Time Recorders**  
Chicago Time Register Co., Chicago, Ill.

**Nanz, C. & Co., 127 Duane St., N. Y.**  
Simplex Time Recorder Co., Gardner, Mass.

**Waggoner Watchman Clock Co., Grand Rapids,**  
Mich.

**Tin Mills**  
Philadelphia Roll & Mch. Co., Phila., Pa.

**Phillips, F. R. & Sons Co., Phila., Pa.**

**Tinners' Tools and Machines**  
Niagara Machine & Tool Works, Buffalo.

**Tin Plate**  
American Tin Plate Co., N. Y.

**Champion Iron & Steel Co., Muskegon**  
Mich.

**Merchant & Co., Inc., Philadelphia, Pa.**

**Tin Plate Machinery**  
Lloyd Booth Co., Youngstown, Ohio.

**Tinware**  
Keen & Hagerty, Baltimore, Md.

**Tinware Machinery**  
Shuster, F. B. Co., New Haven, Conn.

**Tobin Bronze**  
Ansonia Brass & Copper Co., 99 John St., N. Y.

**Toe Calks, Steel**  
Burke, P. F., Boston, Mass.

**Tool Chests**  
Am. Tool Chest Co., 300 W. Houston St., New York.

**Bliss, R. Mfg. Co., Fawtucket, R. I.**

**Tool Grinders**  
Seiders, Wm. & Co., Inc., Phila., Pa.

**Union Mfg. Co., Buffalo, N. Y.**

**Tool Holders**  
Hogson & Pottis Mfg. Co., New Haven, Conn.

**Tools**  
Athol Machine Co., Athol, Mass.

**Braunsdorf-Mueller Co., Elizabeth, N. J.**  
Brown, R. H. & Co., New Haven, Conn.

**Goodell Pratt Co., Greenfield, Mass.**  
Mayhew, H. H. Co., Shelburne Falls, Mass.

**Millers Falls Co., 28 Warren St., N. Y.**  
Springfield Machine Screw Co., Springfield, Mass.

**Stanley Rule & Level Co., 29 Chambers**  
St., New York.

**Starrett, L. S. Co., Athol, Mass.**  
Stevens, J., Arms & Tool Co., Chicopee, Mass.

**Tools, Blacksmith and Wheelwright**  
Champion Blower & Forge Co., Lancaster, Pa.

**Wiley & Russell Mfg. Co., Greenfield,**  
Mass.

**Tools, Steam and Gas Fitters'**  
Saunders' Sons, D., Yonkers, N. Y.

**Torches, Oil and Gasoline**  
Schneider & Trenkamp Co., Cleveland, O.

**Tote Boxes**  
Clark, W. J. & Co., Salem, O.

**Toys, Iron**  
Coleman Hardware Co., Chicago, Ill.

**Transom Openers**  
Ormsby, E. A., Melrose, Mass.

**Tree Guard**  
Hartman Mfg. Co., 309 Broadway, N. Y.

**Up-to-date Mfg. Co., Terre Haute, Ind.**

**Trolleys**  
Box, Alfred & Co., Philadelphia, Pa.

**Trowels**  
Bishop, Geo. H. & Co., Cincinnati, O.

**National Saw Co., Newark, N. J.**

**Trucks**  
Boston & Lockport Block Co., Lockport, Pa.

**Fairbanks Co., 311 Broadway, N. Y.**  
Kilbourne & Jacobs Mfg. Co., Columbus, Mich.

**Lansing Wheelbarrow Co., Lansing,**  
Mich.

**Syracuse Chilled Plow Co., Syracuse,**  
N. Y.

**Tub Hoops**  
Oatman Bros., Medina, Ohio.

**Tube Expanders**  
Henderson, A. L. sons, Wilmington, Del.

**Tubes, Seamless Drawing Copper, Brass and Bronze**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Randolph-Cloves Co., Waterbury, Conn.**

**Tubing, Brass**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Ivins, Ellwood, 487 Broadway, N. Y.**  
Phoenix Tube Co., Brooklyn, N. Y.

**Spofoff, W. S. & Son, Providence, R. I.**

**Tubing, Iron**  
Phoenix Tube Co., Brooklyn, N. Y.

**Tubing, Seamless**  
Ivins, Ellwood, 487 Broadway, N. Y.

**Tubing, Steel**  
Harris, Sam'l & Co., Chicago, Ill.

**Heat Transmission Co., Danbury, Ct.**  
Ivins, Ellwood, 487 Broadway, N. Y.

**Jannet, Steinmetz & Co., Phila., Pa.**  
Lang's John S. Son & Co., 4 Fletcher St., Melrose, C. E. & Co., Phila., Pa.

**National Tube Co., Pittsburgh, Pa.**  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

**Tumbling Barrels**  
Henderson Bros., Waterbury, Conn.

**Northern Engineering Works, Detroit,**  
Mich.

**Tungsten Metal**  
Wolfgram Works, Roswein, Saxony.

**Turnbuckles**  
Cleveland City Forge & Iron Co., Cleveland, O.

**Merrill Bros., 465 Kent Ave., B'klyn.**

**Twist Drills**  
Cleveland Twist Drill Co., Cleveland, Mass.

**Morse Twist Drill & Machine Co., New Bedford, Mass.**

**New Process Twist Drill Co., Taunton,**  
Mass.

**Slocumb, J. T. & Co., Providence, R. I.**  
Standard Tool Co., Cleveland, O.

**Twist Drill Grinders**  
Heald, L. S. & Son, Barre, Mass.

**Washburn Shops of Worcester Polytechnic Inst., Worcester, Mass.**  
Wilmarth & Morman, Grand Rapids.

**Union Couplings**  
Dart, E. M. Mfg. Co., Providence, R. I.

**Upholsterers' Hardware**  
Hungerford, U. T., Brass & Copper Co., 121 Worth St., N. Y.

**Valves, Gas, Water and Steam**  
Ashton Valve Co., Boston, Mass.

**Chapman Valve Mfg. Co., Boston.**  
Crosby Steam Gage & Valve Co., Boston.

**Jenkins Bros., 71 John, N. Y.**  
Kennedy Valve Mfg. Co., 75 John St., N. Y.

**McNab & Harlin Mfg. Co., 55 John, N. Y.**  
Mason Regulator Co., Boston, Mass.

**Wood, R. D. & Co., Philadelphia, Pa.**

**Varnish**  
Standard Varnish Works, 29 Broadway, N. Y.

**Vegetable Slicers**  
Stretcher, N. R. & Co., Rochester, N. Y.

**Ventilating Fans**  
American Blower Co., Detroit, Mich.

**Bayley, Wm. & Sons Co., Milwaukee, Wis.**  
Boston Blower Co., Hyde Park, Mass.

**Buffalo Forge Co., Buffalo, N. Y.**  
Exeter Machine Wks., Boston, Mass.

**Perkins, B. F. & Son, Holyoke, Mass.**

**Ventilating System**  
Ormsby, C. A., Melrose, Mass.

**Ventilator Appliances**  
Howard & Morse, 45 Fulton St., N. Y.

**Ventilators**  
Drouve, G. Co., Bridgeport, Conn.

**Merchant & Co., Inc., Philadelphia, Pa.**  
National Pancoast Ventilator Co., Phila., Pa.

**Ventilator Openers**  
Ormsby, E. A., Melrose, Mass.

**Vises**  
Athol Machine Co., Athol, Mass.

**Biggall & Keeler Mfg. Co., Edwards,**  
Ill.

**Hollands Mfg. Co., Erie, Pa.**  
Howard Iron Works, Buffalo, N. Y.

**Lewis Tool Co., 44 Barclay St., N. Y.**  
Parker, Chas. Co., Meriden, Conn.

**Prentiss Vise Co., 44 Barclay, N. Y.**  
Utica Drop Forge & Tool Co., Utica, N. Y.

**Wagon Jacks**  
Covert Mfg. Co., West Troy, N. Y.

**Covett's Saddlery Works, Farmer, N. Y.**  
Lane Bros. Co., Poughkeepsie, N. Y.

**Washers**  
Hal's, Sam'l Sons 229 West 10th St., N. Y.

**Haskell, Wm. H. Mfg. Co., Fawtucket,**  
R. I.

**Nut & Washer Mfg. Co., Milwaukee, Wis.**  
Wilson & Smith, Worcester, Mass.

**Washers, Lead**  
Milton Mfg. Co., Milton, Pa.

**Washing Machines**  
Brammer, H. F. Mfg. Co., Davenport, Ia.

**Clark, Quilen & Morse, Peoria, Ill.**  
Richmond Cedar Works, Richmond, Va.

**Wayne, Anthony Mfg. Co., Ft. Wayne,**  
Ind.

**Watchman's Clocks**  
Nanz, C. & Co., 127 Duane St., N. Y.

**Waggoner Watchman Clock Co., Grand Rapids,**  
Mich.

**Water Gates**  
Kennedy Valve Mfg. Co., 75 John St., N. Y.

**Water Wheels**  
Poole, Robt. & Son Co., Baltimore, Md.

**Well Supplies**  
Cook, A. D., Lawrenceburg, Ind.

**Wheelbarrows**  
American Steel Scraper Co., Sidney, O.

**Kilbourne & Jacobs Mfg. Co., Columbus,**  
Lansing Wheelbarrow Co., Lansing, Mich.

**Syracuse Chilled Plow Co., Syracuse,**  
N. Y.

**Wind Mills**  
Flint & Walling Co., Kendallville, Ind.

**Window Cord**  
Samson Cordage Works, Boston, Mass.

**Window Fasteners**  
Lansing Works, New Britain, Conn.

**Window Weights**  
Barney & Reed Mfg. Co., Boston, Mass.

**Wire**  
Dillon-Griswold Wire Co., Sterling, Ill.

**Grand Crossing Tack Co., Grand Cross,**  
Ing, Ill.

**Kidd Bros. & Hatcher Steel Wire Co.,**  
McKees Rocks, Pa.

**Miller & Van Winkle, Brooklyn, N. Y.**  
National Wire Co., New Haven, Ct.

**New Haven Wire Mfg. Co., New Haven,**  
Prentiss, Geo. W. & Co., Holyoke, Mass.

**Reading Screw Co., Norristown, Pa.**  
Spencer Wire Co., Worcester, Mass.

**Stewart Wire Co., Easton, Pa.**  
Summit Wire Co., Cuyahoga Falls, O.

**Townsend, C. C. & E. P., New Brighton,**  
Trenton Iron Co., Trenton, N. J.

**Warner Br. & Co., Bridgeport, Conn.**  
Wolf, R. H. & Co., Ltd., 115th St. and Harlem River, N. Y.

**Wright & Colton Wire Cloth Co., Wor-**  
cester, Mass.

**Wire Chains**  
Bridgeport Chain Co., Bridgeport, Ct.

**Hungerford, U. T., Brass & Copper Co.,**  
121 Worth St., N. Y.

**Onella Community, Ltd., Niagara Falls,**  
N. Y.

**Wire Cloth**  
Barnum, E. T., Detroit, Mich.

**Clinton Wire Cloth Co., Clinton, Mass.**  
Derby, Edward & Sons, Philadelphia.

**Ester Wire Works Co., 66 Fulton St.,**  
New York.

**Gilbert & Bennett Mfg. Co**

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